STAFF WORKSHOP

BEFORE THE

CALIFORNIA ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

In the Matter of:	)	
	)	
Green Building Initiative	)	Docket No.
Benchmarking	)	
(Commercial Sector)	)	
_____	)	

BONDERSON BUILDING AUDITORIUM

HEARING ROOM 102-A

901 P STREET

SACRAMENTO, CALIFORNIA

THURSDAY, APRIL 7, 2005

10:12 A.M.

Reported by:
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Contract No. 150-04-002

COMMISSIONERS PRESENT

Jackalyne Pfannenstiel

Arthur Rosenfeld

STAFF PRESENT

Al Garcia

Dale Trenschel

Martha Brook

William Pennington

ALSO PRESENT

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Lawrence Berkeley National Laboratory

Mary Ann Piette
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Robert Rose
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San Diego Gas and Electric Company

Gregg D. Ander
Southern California Edison Company

Jim Parks
Sacramento Municipal Utility District

Peter W. Turnbull
Pacific Gas and Electric Company

ALSO PRESENT

Gary Gero
Los Angeles Department of Water and Power

Len Pettis
Office of the Chancellor
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Craig D. Sheehy
Thomas Properties Group
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California

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P R O C E E D I N G S

10:12 a.m.

MR. GARCIA: Good morning. Welcome to the Energy Commission's workshop on benchmarking. And I just want to say a few words before I turn it over to Vice Chair Pfannenstiel and Commissioner Rosenfeld.

The reason that we're having this workshop is that the Governor issued an executive order in December that assigned a number of different tasks to the various agencies within the State of California.

The Energy Commission was one of those, and one of our tasks was to develop benchmarking guidelines with the idea that we would be benchmarking, or cause the benchmarking of all commercial buildings in California, which is a daunting task, as we'll see from some of the presentations that the utilities are going to make when they talk about their service territory.

One of the things that I wanted to say, at least my objective in this workshop, is to establish a baseline of understanding about what we're talking about when we say benchmarking. That we have an understanding of what the overall

role, which is to benchmark all commercial buildings in California, to get a really, a good sense of the size and magnitude of this task.

And last, but not least, to get and flesh out what are the public policy issues, as well as some of the major implementation issues.

One of the things we're not going to be doing in this workshop today is trying to develop a consensus on details. We're going to be doing that down the road. So, don't be looking for that.

Before I ask Art and Jackie to talk, I want to point out that there's two exits; one at the back and one at the front of the room. The restrooms, if you need them, are across the hall, ladies on one side and men on the other. I'm going to ask that you turn off the ringer on your cellphone, as I'm doing, myself, right now.

We're not really going to have any scheduled breaks during the day because we've got a pretty well packed agenda. So if you need to go outside for whatever reason, just please go ahead and do that. We will be breaking later on for lunch.

We're got the court transcriptionist,

and everything that's being said is being recorded. We've got a call-in number, and I don't know that we've got somebody on the line. I think there's somebody on there right now. But the transcripts are going to be available on our website in about ten days or so? I guess so.

And with that, you know, I'd like to introduce Acting Chair Jackie Pfannenstiel. Jackie, if you could give us some comments?

ACTING CHAIRPERSON PFANNENSTIEL: Well, first, I'd really like to say just welcome to people; and we appreciate the people in this room who are here to help us on what's an important, and sort of at the moment, first steps in a pretty significant part of a greater effort.

This green buildings initiative emerged from a statement in Governor Schwarzenegger's State of the State Address last January, January of '04. And then emerged, I think, in greater detail in the executive order last December.

The point I guess all of us here realize is to make the existing buildings, commercial and government buildings in California, more energy efficient. I think that the existing programs in California have done a pretty good job on new

building construction. And we've made a lot of progress, perhaps the best in the nation, in new building construction.

But we all recognize that the heart of the problem with building efficiency are those already existing buildings. And we need to find a way to get to those. And the green building initiative is an opportunity to address that part of the problem.

It fits in with the efforts that the Energy Commission and Public Utilities Commission have been engaged in for a couple decades now of building standards and efficiency incentives, and education. And let me talk about the education component for a minute.

The information that building owners or managers or tenants have is a good part of what we're doing here today. Benchmarking, itself, doesn't provide more efficient buildings. Benchmarking is a tool, but even, itself, isn't the whole tool. It's really just part of that important information effort that we need to get out to the customers.

But what it needs to be first of all is it needs to be valid; it needs to be something

that people can rely on and believe in, and understand. And so a good deal of what we're doing here today, and I think from this going forward, is making sure that the metrics that we're using, that we're sort of lumping in this big category of benchmarking, are metrics that are credible, reliable and are seen as valid.

So I, you know, appreciate your active participation. I hope that people are here with lots of good ideas and suggestions. We're certainly looking for them. A lot of people in this room have good experiences that we're going to share. I ask for your open minds and creative juices to flow.

So, thanks again for being here, and I'll turn it over to Commissioner Rosenfeld.

COMMISSIONER ROSENFELD: Al, you mean we've got to go to lunchtime without any coffee?

(Laughter.)

MR. GARCIA: Sorry.

COMMISSIONER ROSENFELD: Welcome. It's nice to see a roomful of people who are interested in benchmarking. Usually it's hard to get a quorum of people who are interested in benchmarking.

I wanted to amplify a couple of sentences on what Jackie just said, and add one thought about interval meters and the fact that we're going to have a lot more data than was around when EPA started its tool, and when Berkeley started working with CalArch.

First of all, just a remark about where I see benchmarking fitting into a whole program called the green buildings initiative, which Jackie just mentioned.

I was on the steering committee. To my mind, since I work a lot with the Public Utilities Commission, the main tool for making public buildings, nonres buildings more efficient is the already wonderful and growing better programs based on public goods charge, and procurement money. I think those budgets now run $400 million a year, and about a third or a little over a third of it goes to commercial buildings. So there's a huge and successful program going on.

And the utilities, as administrators, have the goal of improving energy efficiency at least 1 percent a year.

We're not going to make any big changes in that program until the planning years of '06,

'07 and '08. It's a three-year cycle. So, what we're discussing in terms of benchmarking tools today is something that's got to be useful, brought into operation during that cycle, and better be useful for a lot longer than that.

So, better, in my mind, to take some time to get a good useful tool which will then encourage -- this is the education angle -- will encourage building owners to say, oh, here's how I compare with my neighbors; maybe I'm not as good as I thought; maybe I should go in for commissioning as being offered by my friendly utilities; maybe I should even be going in for some retrofit.

Now, the one thought I wanted to add is that when EPA got in the business with its tool, and when Berkeley started doing these things we were confronted mainly with monthly utility bills. Right now, we have interval meters in the state for every customer over 200 kilowatts. And actually that represents a lot of power. It's only 50,000 meters, but it's one-third of the power already has interval meter data.

Moreover, as most everybody in this room knows, as a result of what seems to me like an

interminable series of workshops working with the utilities, PG&E and San Diego have decided they want to do interval metering and demand responsive pricing and critical peak pricing for the whole state. And those meters, millions of them, will go in over the next like three years. And Southern California Edison, I think, is going to come along and let PG&E and Edison have the birth pangs, and then come along a year or so later with the same thing.

So, we're facing a brand new world in which, to my mind, benchmarking becomes sort of graphical. Building owners will be told, yeah, your energy budget was right in the middle, or it's in the worst quartile or it's in the best quartile. And here's the shape of your energy use. And you seem to be particularly having trouble nights and weekends. Maybe some dampers stuck on your controls, or whatever. But it becomes a lot more interesting and a lot more data and a lot more interesting for diagnosis than it was before. And so we're going to have to revamp our tools to take advantage of that sort of thing.

So, one other question that used to come up, and I think has now subsided, is are we

benchmarking for energy use, or are we benchmarking for peak power. I think the average customer is interested not obsessively on either. For the new building standards, and I hope for retrofit of existing buildings, the Energy Commission and the PUC have adopted time dependent valuation of electricity, which means that there's an avoided cost for electricity published for every hour of the weekdays in July or weekends and nights in July.

And what people want to do is reduce their overall energy costs, which means their overall energy budget. So that sort of automatically takes care of what we're trying to minimize. Once we get people's attention, of course, we can look at the right hour of the day and try to figure out whether the problem is nights or the problem is peak times. But I think we've got to introduce the time dependent valuation of electricity into the whole thing.

So that's my sort of update on what I think has changed in the last year or so, and what I hope we'll bear in mind as we plod through the day. Thank you very much, Al.

MR. GARCIA: Thank you, Art. And I

guess before we get started, there was one thing that I wanted to do. And that, you know, a lot of times when you go to these kinds of meetings you try to recognize who has traveled the furthest to get here. And we have Bob Rose from EPA who came from the east coast. But, on the other hand, we have Commissioner Rosenfeld who came from Hawaii. So I think Art wins.

COMMISSIONER ROSENFELD: So between us we were, what is it, three plus three, six time zones apart, and here we are meeting in Sacramento.

MR. GARCIA: So, anyway, drinks are on Art after this thing.

(Laughter.)

COMMISSIONER ROSENFELD: As long as it's coffee.

(Laughter.)

MR. GARCIA: But, seriously, you know, these opening remarks by Commissioners Pfannenstiel and Rosenfeld give us some food for thought as to, you know, the background and where we're going with all of this.

One of the things that we did in preparation for the workshop is we put together a

pretty basic primer on what benchmarking is all about. And if you didn't receive one of those, you can go to our website and download it, and take a look at it. But hopefully it will have incited some thought and prompted some questions and comments from you.

Our first speaker now is Evan Mills. And Evan is with Lawrence Berkeley National Labs. And awhile back I was at another meeting and Evan was talking about benchmarking. And, you know, I was really taken by his presentation. I thought that this would be a good place to start, that would get us going on the right thoughts.

I'm going to ask that the speakers, if they have business cards on them, leave them with the court reporter; that will make his job a lot easier to do.

So, with that, Evan, if you could.

DR. MILLS: Thank you very much, Al, for having me, and, Commissioners; it's great to be here. And it's nice to see so many friends and colleagues and many people who are both.

So I'll go for about half an hour, is that what you'd like?

MR. GARCIA: Yeah.

DR. MILLS: It's in power-saving mode, yeah; it's gradually coming awake.

I have the pleasure of talking, more generally setting a backdrop before we get into the technical issues later in the day. Look at the question of benchmarking from 30,000 feet. Give you a whirlwind tour through some of the issues. And I'm going to start outside of the energy realm and just reflect for a couple minutes on more broadly what benchmarking is, some of the history of it. And get into some of the energy issues, the nuances, some of the problems, the challenges, and some kind of suggestions for how to apply it in an effective way going forward.

This was a fun little chart that I found on the internet. It's actually an animated little gif and these pingpong balls drop from the top and they go through this obstacle course. And they distributed themselves out against the Bell curve and you can watch it in real time. And it's just a reminder that real data often isn't as neat as the theory that's behind it. But on average it works out.

The history of benchmarking goes back to way before energy issues. I'm going to take my

cards back -- I thought, you know, one of the reasons for benchmarking is to describe -- maybe you can help -- describe complicated systems. And as the Commissioner said, informed action. Benchmarking, itself, isn't an end, it's an information-gathering, but it's just part of a process to inspire.

And some of the history of benchmarking goes back to the moon, to the understanding of the tides. And the first benchmarks that I'm aware of were like this photograph on the left which is from Tasmania in 1841 where people benchmarked the ocean shore. It was called bench at that time; and you would cut a mark into the stone to show where the median or high tide level was. And that's where at least some of the very earliest benchmarking happened.

Involves -- today it's still done. And involves a lot of technology, measurements, data processing, remote transmission, technology, calibration load, the issues that we have with buildings. It's also not completely unrelated to why we're here today, the little chart shows sea level rise and the issue of global climate change and sea level rise. And these data come from

benchmarking. They come from the technology and the tradition of benchmarking.

Lots of familiar benchmarks out there in the world. We've all heard of the IQ scale. These are actually a lot of different metrics of intelligence in the horizontal scales that go below the Bell curve, but the whole idea of a Bell curve is statistical distribution of data, what do you make out of it.

Bell curve is used in issues that are of relevance to a lot of us. Climate change can change the distributions of data. The incidence of extremes or outlyers. The little chart on the bottom has the temperatures in Europe, summer 2003. The little red arrow on the right, six standard deviations from normal. Without benchmarking, without the practice of knowing what the population in this case, historical data, are doing, you can't really know whether a given event is significant or not.

A lot of indexes, a lot of benchmarks, very familiar. The DowJonesIndex in green. A couple of stocks that people are interested in. Benchmarks are a part of a lot of our lives and part of our information environment.

Somehow the energy field is, in a way, one of the last to come to benchmarking, I might even hazard to say. It's had a tradition in education, weighing performance in financial indicators, in technology. It's very widely used. As a new father of twins, I look at the Huggies box quite often and here's kind of a consumer benchmarking system that has some dubious value. But I'm seeing weight versus diaper size. As a parent I don't need to know the weight of my child to know the diaper size. I'm not sure who this benchmark is for. It's a question to ask. What are our graphics; what are our metrics; is it really serving the needs of our audience; is it actionable. But it's a nice picture to look at.

Also, the scale is not linear. The distance between 10 and 20 is about half the distance from 20 to 40. So it's demanding a lot of the consumer here to actually parse this information.

The bullseye, you know, is maybe one of the most familiar benchmarking tools, right? You have a target; you shoot at it; and the distance is a sense of benchmarking score, how good is your aim. This isn't a bullseye; these are tests on a

geographic global positioning systems. And the true location is the red dot in the middle. But these different products did better and worse in actually locating the true location. But it's a benchmarking; it's a method of visualizing accuracy.

So, energy. Why do we want to do energy benchmarking? A number of reasons. I'm sure there are others. We want to know a baseline; we want to know where we are today. We want to follow perhaps performance over time. We want to validate that our design intent for the building, for the system is being achieved. Are we getting energy performance that our models told us we should get.

What are best practices. What is good. What is the standards that we're shooting for. What might we save by doing better from where our benchmark tells us we are today. How do we prioritize those efforts getting into the end-use benchmarking, or the engineering implications.

Is our building going off the rails; are we having performance problems. As Art mentioned, as we get better metering, real-time diagnostics, our benchmarks may tell us from hour to hour that

some system is going out of tune, needs attention.

And I think last, but not least, is educating and inspiring. The benchmark ultimately needs to matter, not only to a building engineer, but to a decisionmaker, stimulate action.

Art referred to what are the metrics, what are we benchmarking. There's no one right answer. There might be the most appropriate answer that you all conclude for California. But there's energy, first energy benchmarking I encountered was kBtus per square foot for degree day. In the old days we use to call that 1-Art, after Art Rosenfeld, who drew plots of that all the time for residential buildings and so on.

There are other energy metrics. Single fuels, all energy; peak power came up; costs. I think it's very important to not be bound to the engineering and thermodynamic metrics, but the financial metrics.

In the EU they're working on buildings carbon benchmarking systems, CO2 benchmarking, as opposed to energy. Systems like LEED look at a unit list system of just a point scale, a scale from 1 to 100.

And then there's service levels. Some

examples I'll show you actually don't even talk about energy, but about the energy service being provided.

So, lots of approaches. Kind of analytically there's the Bell curve kind of idea, looking at yourself in relation to a population. There are kind of point estimates related to other point averages, looking at yourself compared to best practiced. There's using a simulation in reality, model-based benchmarking it's often called.

There's kind of normalized benchmarks, test procedures that are done in kind of a laboratory environment as opposed to a real world environment. Scope and timeframe benchmark can be self referential; how is my building doing compared to how it was doing or how it could be doing. Or it could be looking at an enterprise, all of the hotels I own, or all of the buildings in the state, relationship to building codes and kind of regulatory or policy-related benchmarks that are out there.

And timeframe, is it historic; is it current: future looking. Lots of energy benchmarks of various sorts out there already. We

have the -- they all have different purposes, different metrics. Lead is a unitless number that combined energy and non-energy effects. EnergyStar, very well known.

Where are you is kind of a tier of performance for on a whole-building basis, or on a product basis. The energy guide labels, how good is this fridge compared to its peer group. Fuel economy for cars.

So there's a tradition, of course, of energy benchmarking that's out there already. And we all need to decide how to relate to that.

Scale. You know, we can look at carbon per capita, or efficiency at a chiller level. So it's a big question, you know, what are we benchmarking, a whole building, a component within that building. No one right answer.

These are oil refineries on the left, looking at a fleet of oil refineries over time. This is actually in Canada. On the right is one refinery, watching it as it makes various improvements. There's different ways to slice and dice the data.

It's very important to decide what's important before you kind of devise and adopt a

tool. The upper panel is fuel economy over time. I think 1970s through 1990s. And the upper curve is Japanese imports to the U.S. And the lower curve's varied classes of American cars. So what are the kind of cohorts that you want to look at.

The lower one is also about automobiles. You have fuel economy, but also horsepower per engine size, indoor volume. There's a lot of ways to benchmark automobile performance or amenities. And you'll get a different answer depending on which indicator that you pick.

Here's for cars, '77 through '95. The upper shows fuel economy kind of rising and then leveling off. The lower one shows fuel use, or energy billed, you could say, for cars. A very different story. We got better, and then we actually got worse again because driving is increasing.

And those two benchmarks are of exactly the same phenomena, the same kind of technologies, but they give you different conclusions about how well we're doing in energy efficiency in cars. They're both true, they're both accurate, but they address different questions and suggest different recommendations.

A lot of the rest of the talk will be more specific examples about energy and buildings. These are benchmarks for datacenters. And each of these, 1 through 16, are different datacenters. I think all in California. This is from some PIER-funded work. And the red and blue curves are just the -- the blue is the datacenter, as is. And the red is fully loaded out with servers.

And I provided a very important reality check, the rule of thumb at the time was that a typical datacenter needed 250 watts per square foot of capacity behind it. But we're seeing nobody exceeding even 100. So benchmarking is going to be very important for policymakers in verifying rules of thumb or conventional wisdom. And often it's very surprising. You actually go a look at something and you find that the energy needs are different than what people thought.

These are -- since Art just got back from Hawaii, these are Hawaiian grocery stores. Looking at -- this is kind of getting into the issue of enterprise level benchmarking, so we have Safeway and Food Land and so on. And now we're looking at end uses within. So we see energy varies across different type of market, but also

by end use within the market. A little more detail.

Again, enterprises, these are different hotel chains in Europe. Seeing a factor of two or even three variation in energy is within a hotel chain very important; and I think Bob and others have seen that with the EnergyStar tool; a lot of popularity in applying it at the enterprise levels because people see within their own stock of buildings a lot of variability.

But, also, of course, across enterprises; and why is it that this two star hotel is using half as much energy as a five star hotel.

The choice of indicator is so important. Here's some CEUS (phonetic) data from the last CEUS survey. We're seeing bars and taverns on the left with the red oval around them. And we've got -- this looks like the most efficient class of restaurant in energy per unit of floor area. There's the variability. We look at energy per meal; totally different story. Very high variability, different conclusions, different rankings.

Here's the same kind of story for

Europe. These are restaurants, energy per meal versus energy per floor area. Cafes are the best per floor area, but they're the worst, so to speak, by meal. So the answers you get will depend on how you frame the question.

And, of course, if you really want to complicate things, call in the Swiss. And here they've looked at energy per menu item within restaurants. So we've got salads and lamb and everything else. These are starters and these are full-course meals. The yellow is the embodied energy, so the lamb from New Zealand has the most energy intensity. So, I was worried about apples and oranges, but what type of apple are you looking at. Obviously way beyond what we can do in California, but benchmarking is -- once you start pulling on that thread it can lead you all kinds of places.

One thing I wanted to get across is that while we all focus a lot, as we should, on offices, schools, mainstream buildings, especially in California the high tech sector is very very important, whether it's datacenters, laboratories, clean rooms. These are results from PIER-funded research on benchmarking that's ongoing for clean

rooms.

And here we see the air movement benchmark which has units of cfm per kilowatt, so higher is better, more movement of air per kilowatt. Very badly designed air distribution systems with lots of pressure drop and losses. And these are different clean rooms.

And we see, even for similar clean rooms in terms of cleanliness class, wide variation in the energy, or the power requirement in this case, to get a certain amount of air flow. Why is that, you know, what can it tell us about good and bad design practices.

Here's another one. This benchmark doesn't even talk about energy. It's air changes per hour in cleanrooms. We have up to 600 air changes per hour in this one; down to 100 in this one. You have to be careful; these are class 10 and that's class 100. These are cleaner, but even within the clean ones a lot of variation to get the same service, to get the same quality environment. So we don't even have to look at energy to get a benchmark of relevance and of use.

Last one is the chiller efficiency. So benchmarking can be done at the equipment level.

And these are kilowatts per ton numbers for a lot of clean room chillers. And we differentiate by different types of cooling equipment with the two purple lines. You can begin to tease out which kind of systems perform better than others.

These, I think, are all California cleanrooms.

Not to focus you on the details, but I was glad to see Commissioner Pfannenstiel mention, and Rosenfeld, what is the metric; what is the figure of merit. These are all different metrics for cleanroom benchmarking. They're all interesting, but they all give you different results. So what is the figure of merit. Lots of different ones. And I think you need to look at your market; you need to look at the decisionmakers. What matters to them. And it may be dollars and not energy. And it may be, you know, energy per meal, or energy per student week in a school, and not Btus per square foot.

We're working on laboratory benchmarking. This is work done under support of EPA and DOE under the so-called Labs-21 program, an active national program. And we're benchmarking lots of laboratories and teasing out

best practices, standard, good, better.

How do we use the benchmark; what is the relevance. It's part of a larger whole. It's part of building design, commissioning, operations, continuous improvement. It's not an end, in itself. You want to get out beyond the benchmark to guidance, guidelines.

Here's some work also from PIER. These are a bunch of schools. Btus per student year. But then they did the subtraction from, I think, the median level here. They subtracted for each school, and then turned it into money. So these are dollar savings if the school went to median best practice, median practice.

How do you turn the data into knowledge; how do you turn the raw information, which is important, into something that helps a manager flag, wow, there's a school to go after, or to understand better what's going on.

Are there other tools out there. Of course, you'll hear about a number of them today. Here's one additional dimension. This is the Labs-21 benchmarking tool that's strictly for labs. A web-based tool; you can enter your laboratory, get various diagnostics. So there are

other existing activities to look at, understand, relate to as you go forward; add value to, if possible.

Another CEC PIER-funded activity. This is a design intent tool. One of the uses of benchmarking is to record that somewhere where it won't get lost; where one year, two years, five years after a building is constructed, the owner/ operator can go back and say, well, why was this system chosen. What was the expected performance. And how am I doing compared to that expected. And that's what the design intent tool is about, is to help record and memorialize the design objectives. And there's an area in here for metrics for benchmarks.

So some of the issues, some of the hard questions to ask as you go forward. Intensity is not equal to efficiency necessarily. Being careful not to always equate the two. This apples-and-oranges issue will always be there, even down to which menu item you've got. And it's just got to be reconciled.

Ideally, you know, in principle, energy pre unit service is maybe more what the market wants or can relate to, but hard to quantify

always.

How do you normalize. What's the so-called denominator. How do you adjust data. Weather is obviously a huge issue; floor area; all the different ways that it can be defined; occupancy schedule. A lot of things that Bob and others have dealt with in the EnergyStar benchmarking tool. What about plug loads; what about the indoor conditions. A lot of these things that vary.

If you're doing economics, do you compare, you know, a building in the Northwest at 2-cent a kilowatt hour electricity to a building in Sacramento with 16-cent a kilowatt hour electricity.

This is some distribution, I think from CEUS, of schools and just distribution of energy per square foot. And this darker blue area is schools that have pools, you know, so swimming pools. Big factor in that you could say the service level is different. These schools are more energy intensive, but they're also providing an amenity and a service that's different from the nonpool schools. So taking care not to compare incomparable cohorts of buildings.

So some recommendations or things to think about. Again, think about the users or how is that tool going to be used. There may not just be one. What are the type or types of benchmarks; what are the metrics. Think about your audience.

Of course there's a data collection problem, and the new meters are very exciting, you know. And the ability to use the internet and handle and collect data more cost effectively, will make it possible to do benchmarks that back in the years of "kBtus per square foot per degree day" we couldn't even conceive of. But what data do we need; how do we collect it; is it onerous.

Different levels of benchmarking so we could have the kind of entry level benchmarking that could be very crude for the masses; and then drilling down to more sophisticated benchmarks for the subsets of people who want to invest the time and the energy.

I think, you know, an important thing that we don't talk about enough is that benchmarking is done already for nonenergy reasons by a lot of our constituencies. Schools benchmark education performance.

The high tech industry, of course,

processors speeds, computer performance. I think telling a datacenter operator how much energy per square foot they use is probably as close to useless as you can get, because datacenters have different, you know, reliability standards. They're full, to varying degrees, of equipment. They probably all have 24-hour operation, but their output is not, you know, servers per square foot. It's, you know, megabytes per second, it's data processing.

So how do you get to a -- and they're benchmarking themselves all the time by other measures. So can you make it hour-to-energy benchmarks compatible or combinable somehow with theirs. It's a challenge, it's a big challenge. But there's a current practice out there. Benchmarking is a familiar activity to a lot of your audience.

And, you know, it's a one-handed clap, like we started with. What's going to be done with it. It's not an end in itself.

From some of our Swiss colleagues, this profound statement: Defining a benchmark is not just a technical challenge, but it prestructures your conclusions and your policy choices. And

that's okay, but just take care that as you do that you know what you're blinding yourself to and what you're shining light on.

So back to the moon where we started. Here's an interesting benchmark of the DowJones stock index performance as a function of the lunar cycle that floats around. And they claim that in between the phases are where it does the best and the worst. You'll notice that this is the different between 999 and 1000, the DowJones -- or 9999 and 10,000, whatever it is. Dubious analysis. But they do warn us that benchmarking is, by no means, a stand-alone approach to stock picking.

(Laughter.)

DR. MILLS: So you need to combine it with other information.

So those are my remarks, and I hope that that's useful to get us started for the day. I've finished, very uncharacteristically, a number of minutes early, so go ahead and use the time, Al, as you see fit. I think you're going to take questions at the far end, maybe.

MR. GARCIA: We'll take questions later, yes.

DR. MILLS: Yeah. You'll need to set up the other machine for the rest of the talks.

Thanks for your attention and lots of luck today, and as you go forward to making this all happen. Al, thank you.

MR. GARCIA: Thank you, Evan.

(Applause.)

MR. GARCIA: Hopefully I did this right. If not, hopefully we'll have an electrical engineer in the audience to give us a hand.

The next speaker is Dale Trenschel. And Dale is the project manager. Is he here? Yes. Dale is the project manager for the AB-549 study. And what the AB-549 refers to is a piece of legislation that was passed back in, I think it was '01. And we're still not there.

But the legislation directed the Energy Commission to produce a report to identify the technical potential for energy conservation, and to come up with a series of recommendations of measures and interventions that could be taken.

And hopefully the Legislature is going to use that as the basis for funding future programs. And it's still not working.

MR. TRENSCHEL: I'm okay here, just not

okay there.

MR. GARCIA: I think this is one of those where --

(Pause. Computer adjustments.)

MR. GARCIA: Sorry about that glitch, but I asked Dale to talk a little bit about the AB-549 effort that he's spearheading. And part of the reason is because in the processing of that project one of the interventions, one of the techniques that they came up with is benchmarking.

Some of you guys have participated in some of the focus groups and some of the other venues that Dale has been involved with. So I thought I'd ask Dale to talk a little bit about that, how that relates a little bit more to this other effort.

So, Dale, take it away.

MR. TRENSCHEL: Okay, thanks, Al.

MR. GARCIA: Thank you.

MR. TRENSCHEL: Evan's always a tough act to follow. Evan, that was great. I don't have a Pampers slide anywhere here, nothing like that.

DR. MILLS: You can borrow mine.

MR. TRENSCHEL: But, anyway. Yeah, AB-

549, I had a few copies over on the table there, but it's a very thin piece of legislation, not even a page and a half. But it has a very broad assignment directed to the Energy Commission. And that is what that first bullet is. It's basically to investigate options and develop a plan to decrease the wasteful peak load energy use in residential and nonresidential buildings, and that's existing buildings.

So that one sentence involves a lot of possible research and effort on our part. And many of you -- I recognize some familiar faces here been involved with the project up to this point, as well.

We produced an interim report for the Legislature in December. And I'll talk a little bit more about what was in that report in a moment.

We're looking at both electricity and natural gas because the legislation just said energy, energy peak load use.

The final report is due to the Legislature October 1st, but in our quest for performance and -- a quality performance, we're going to get there a day ahead, because that's a

Saturday. I don't know that anybody's going to be around on that day.

The legislation was sponsored by the California Building Industry Association. And some of their concerns were that, of course, the Energy Commission produces standards that apply to new construction. And while their background is primarily in the residential markets, the same kind of concerns could be shared for the nonresidential side.

But, of course, one of the things they said is that 80 percent of the housing was built before the standards, so there's a tremendous crop of homes out there that have tremendous energy savings potential. And that also they felt that there was some unfair advantage in the marketplace; there's not much in the way of regulations that cover existing homes or property changes, residential or nonresidential, for that matter.

In the interim report that we furnished in December, one of the things that was in that report was just a characterization of the building markets. On the nonresidential side the figure that was produced was about 6 billion square feet.

Those three largest categories amount to about half of the square footage that we're talking about. And I think the rest is pretty much self explanatory.

The schools and colleges was mentioned in there because there's a lot of old facilities, and the funding sources that they have for efficiency upgrades makes them a good candidate for improvement.

This chart is the absolute best of the technical potential out there, that if everybody did everything that was cost effective, they took every cost effective measure -- and by cost effective generally we mean a payback of less than ten years -- if they took all of those measures and actually did those measures, that this is how the pie would split out.

And, again, this is peak savings. So lighting and space cooling, of course, are the biggest chunks here from the nonresidential side; and about 85 percent if you were to total those together.

So the potential is tremendous out there. We're not saying that we're going to come anywhere close to that in what we're looking at,

but that's the --

COMMISSIONER ROSENFELD: Excuse me, Dale, I can't see the total. You told me how the pie's divided up, but what does this turn out to be in terms of percentage of peak power?

MR. TRENSCHEL: For nonres?

COMMISSIONER ROSENFELD: -- it's 2.5 gigawatts --

MR. TRENSCHEL: Right.

COMMISSIONER ROSENFELD: And what's peak power for commercial buildings? Like 20?

MR. TRENSCHEL: That's a good question. Put me on the spot.

(Parties speaking simultaneously.)

UNIDENTIFIED SPEAKER: That's a little high.

COMMISSIONER ROSENFELD: A little high?

UNIDENTIFIED SPEAKER: -- 50 for the state.

COMMISSIONER ROSENFELD: It's 50 for the state?

UNIDENTIFIED SPEAKER: Yeah.

COMMISSIONER ROSENFELD: Okay, let's say 20 for round numbers, just so I can do the --

MR. TRENSCHEL: Right, then it's --

COMMISSIONER ROSENFELD: So it's 15 percent --

MR. TRENSCHEL: Right, 2.5 up to 20. All right. The way we started to approach this whole assignment given to us, or try to fulfill this legislation, is we thought about what are possible trigger events. And by that we just mean what things happen in the course of a building's life that could be an event where something could be -- there could be a trigger to start or take some action on the part of the customer or the owner of that building.

And so this isn't comprehensive by any means, but these were some of the things that were -- some of the key points that were brought out. The time of sale, -- at the time of sale properties, time of lease, that kind of thing.

We found that -- we had a realty association represented in some of our assistance that was given to us, and just on the residential side alone we were saying about 600,000 homes or more, 650,000 or so homes a year sold. Compared to, what it last year, about 150,000 new homes built. So it gives you a relative indication that, you know, there's a lot of activities out

there where the potential, again, can be very large.

The ones that -- there were several -- let me backspace just a second here in my mind. In putting together how we were going to approach this problem we searched around and tried to recruit -- and some of you were in this audience here -- several people that are knowledgeable on the subject matters.

And that group met once, and then we had some followup work, as well, in a smaller subgroup from that group. We had a larger working group that looked at nonresidential; then we also had a residential side.

Then we formed together some smaller panels that investigated some of the other options that were available to discuss some of the issues that the larger group brought up in a little more detail.

And, of course, on the side of the other -- we have the trigger events on one side, and of course, you have, well, what would you do at that point, what kind of actions would be taken.

And so there was another longer list generated. And I won't go through all of these

here, but, of course, the subject of today's workshop is benchmarking. And, of course, that was one of the things raised by some members in these working groups that we had. And we did have represented several commercial building owners in that group.

This is from the smaller group that I mentioned. We had a nonresidential working group maybe of about 10 or 12 people. We recruited about two or three more additional people or a subgroup of that group to talk about some of the technical issues. You're going to hear more about this from other speakers here today.

One of the things I guess I pulled out of those discussions in those technical groups were benchmarking tools, what should it do. And one of the items was it should offer multiple levels of detail. In other words, you can just -- you go and you get a score, but then for those people that are interested in knowing more of what they could do or being able to find out more details, that they can drill down and have that available to them.

They brought up the idea of distinguishing. It has to be able to distinguish

between efficient operation and the energy efficiency equipment, the functions of the equipment, versus how the building is operated, what the occupancy influences are and that kind of thing.

And, of course, one thing that was already mentioned earlier, as well, was how do we motivate the customer to explore some of those cost effective options once they are identified and they get their score, and they say you can do these various things. But how do you get them to take those next steps.

And, as well, as mentioned earlier, should be able to be repeated. And so that we can use the tool repeatedly to track the performance over time.

We had about five people, I would say, on this use of benchmarking panel. So these were -- we had one group that looked more at the technical issues, the nuts and bolts of well, how are we going to do this, and what should the tool do, and is it possible to do these things.

And then another group which was where we brought back in some of the building owners. And we said, okay, well, if you're -- we're

actually trying to make this use benchmarking in the market, what kinds of things should we be looking at.

And one of the items that came out of that was this focus on the building at the time of refinancing is a big trigger event. I think we had one owner there that said his properties, every three to four years he was refinancing the property. And each one of those would be an opportunity to go in there and benchmark the building and be able to take some further steps.

On the other hand we had another owner that said, well, you know, I have 12 buildings and we don't do that, you know. We're happy with what we have now. So it doesn't really represent a consensus by any means, but it was an interesting point that was brought up.

The group thought, well, you know, we got to look to the utilities to provide the information or see that they're benchmarked. They're the keepers of energy use information, although certainly customers have records of their own energy use.

Again, brought up the idea of how to motivate the customer to pursue the

retrocommissioning if there's a correction that needs to be made to the operational conditions or the problems that they've encountered. Or, on the audit side, to identify what are the cost effective efficiency upgrades they could do.

I think another thing is that building owners widely recognize EnergyStar, of course, and said that it's really important that we have a linkage or a tie, somehow, into that rating method.

Just put together a few other miscellaneous bullets here on some of the other discussion points that came up. There was some support from the building owners to say, hey, you know, we like benchmarking, and we like it because we can say we have an EnergyStar building, or, you know, we've been through and we compared this way, we compare well with other buildings. Distinguish themselves from others.

There was another item, of course, and I think Evan mentioned it, as well. Trying to find a balance between the simplicity of the method used and making sure that it's still technically valid. And so that you don't want to have something that's, even though it may be very

simple and practical, that it misleads the customer in what the information or what that score is at the -- whatever they would get as a result of that benchmarking.

And also being alert to discouraging the customer from taking a deeper look if the number appears satisfactory. So that they say, well, I have a rating of this, I'm in the upper quartile. We're okay and everything looks fine. But then there may still be room for them to do, to take other measures and still increase the efficiency of that building in a very cost effective way.

There were some that thought that it was premature to recommend mandating benchmarking; to put some legislation out that said thou shalt benchmark all buildings from this point forward.

But, on the other hand, another building owner though, you know, we could do this in six months. Now, that was a very active owner that had been doing a lot of benchmarking in their buildings and that kind of thing. So there was some variation of opinion there.

And, again, linking in with EnergyStar. But is there a way to possible add the regional informational component to that so that it's a

little bit more representative of what climate conditions you have in California and those kinds of things, versus some sort of a national average or national comparison.

I'm going to jump off of the benchmarking, because that's really an infancy subject for me, you know. I mean I feel like an infant coming home from the hospital, you know, on benchmarking. But it does crop up as part of this 549 activity.

The things that we have coming up again now is in about two weeks we'll have a contractor report, a draft contractor report, that will be available. And that will be on our website. We are planning to have a staff workshop on that contractor draft May 2nd. And then we would proceed to a staff version of the report on the AB-549 assignment. And, of course, benchmarking is a small part of that. I didn't talk about all the other areas that are being looked at in that report.

And then we would have a workshop sometime, a staff workshop, in late June -- or a staff report, I'm sorry, in late June. If you wanted some more information that's the website

address.

And I had some copies of this presentation available on the table there; there might be a couple left if some of you maybe didn't get one.

That's all I have to say. Thank you.

MR. GARCIA: Thank you, Dale.

(Applause.)

MR. GARCIA: Our next speaker is Mary Ann Piette. It wasn't too long ago that I visited her at her office, high in the Berkeley Hills. I think the unfairness of it all is she actually gets paid to work there. She's got probably the best view of anybody, you know, look out the window; see the entire Bay Area. And on a clear day, can you see the Farallones?

MS. PIETTE: No, I haven't been able to see them. There's a big tree blocking --

MR. GARCIA: But you can probably see the Golden Gate Bridge.

MS. PIETTE: I can see the Golden Gate Bridge.

MR. GARCIA: Okay.

COMMISSIONER ROSENFELD: So this is the view from 300 feet instead of 3000 feet -- 30,000

feet --

MS. PIETTE: That's right.

MR. GARCIA: I think so. Okay, Mary Ann, --

MS. PIETTE: Thank you.

MR. GARCIA: -- take it away. Thank you.

MS. PIETTE: Thanks, Al. And I want to start by thanking the California Energy Commission for having me here today; and a special thanks to the PIER program, to Nancy Jenkins and Martha Brook, because they've been supporting our work in this area. And also thanks to Bob Rose, because they've been supporting some of our work in the past. And I want to make sure that you understand that Bob and I have been working hard in the trenches of benchmarking for some many years now. And we're making great progress because we're all here today talking about benchmarking.

So we're happy to be here and I'm going to -- I wanted to walk around when I talk, but they really want me to --

COURT REPORTER: Give it a go.

MS. PIETTE: -- stay. I'm nice and loud, usually.

COURT REPORTER: Give it a try; I put a mike there to see if it'll pick you up, so --

MS. PIETTE: Give it a try, okay. So, I'm going to start by talking a little about the basics. I'm going to rephrase a few things that Evan said; talk about the California tool that we've developed; why we developed it and where it's going. And then a little about California buildings versus the national buildings, both benchmarking scores and benchmarking methods. And I wanted to spend some significant time on the future directions.

It was great to hear Evan's comments about the world of benchmarking, and also Dale's specific summary of what the AB-549 group is recommending. And then I'll summarize.

So, we've seen these things identified here, how well is it doing performing compared to other buildings; set targets; facilitate property value assessment; gaining recognition; identify actions for energy savings. And that's where the future is in benchmarking. It's really helping us think about where we are today and where we can go to improve these future tools.

And these five arrows here are what I

use as the starting point for benchmarking, which is a little different than the variety of things that you heard. It was great to hear about Tasmania and ocean benchmarking. And I hadn't heard that before. I got the pleasure of hearing from Evan about where that term comes from.

But I always think about it in terms of total quality management and learning processes. And when a business benchmarks its performance against another business, they go through this. What are their issues and collected on their site compared with others, perform some sort of analysis and implement change.

So change management and learning processes are really what we want to help the buildings do. We want to help them understand where they are and what they can do to get better. So we're starting to know how we might do that.

So, the (inaudible) tool was developed because we wanted to understand how to build these kinds of things, and what we could do with the California data. And I'll talk a little about what that data is.

But, essentially we were starting with the energy use per square foot. And as a building

scientist and worked with Art for many years, one of the research questions is do you know a low energy building when you see one. It has a low energy use, you're not freezing in the dark. It's providing some service that's similar to other buildings.

Ideally now we're getting a better idea of a low energy building would be, it has efficient features and it's operated well. You can have old features and operated well, and still be a low energy building. But are the services the same. And Evan talked a lot about that.

So we are, our current tool is based on some initial data from the CEUS data that said, and we didn't do a lot with a lot of the corrections. And I'll talk a little about why.

But essentially what we have is a tool where you put in your energy use and your square footage and your building type and your zip code, and you get a curve of how it compares to other California buildings. And it's an online tool that we started as a prototype, and it's available as a starting point.

The CEUS data is the key here in California. the CEUS data is conducted to develop

the forecasts, datasets from the utilities, about 2000 buildings. It's an extremely detailed onsite audit. These are now getting a little bit old, but they were collected in the '90s.

We have information on the energy uses for PG&E, we have the gas and the electric data. For Edison we only have the electric data. And for San Diego we couldn't get any of the data. So getting the CEUS, working with the CEUS has been a lot of work. And thanks to Martha for persistently working with us, and even getting us this data. So it's the only public interface to that data set and distributions of data in California.

The new CEUS we're all waiting for and looking forward to. We're going to talk about it more. And I know hopefully we'll get to be able to talk about some of these things this afternoon. But the new CEUS is 2800 onsite audits, a year's worth of energy data and calibrated simulation models. So we can start looking at operations and the presence of efficiency features.

We can start understanding why is the energy use high or low compared to others, and a better understanding of characterizing the

commercial sector.

We also have existing work. We're working with the CHPS program, the high performance schools collaborative. And we're collecting data from PG&E; we're collecting data with Daryl Mills, thanks to Daryl. And we're trying to put a school data set similar to the CalArch one. And we're looking at what are the kinds of graphics that communicate best with people. And it could be energy per square foot; sight or source units. And it could even be cost per square foot based on average costs.

So there's a lot of ways. And once we have these data in an online tools there's some different things we can do to help communicate. And we currently are working in that area in the schools area.

Now, this is what a CalArch output plot looks like. And it essentially gives you -- this is the whole building energy use per square foot, and this is the percent of buildings in each of those bins. And this is the schools. And this is a frequency percentile. So if you go to 50 percent here you can see what the median energy use is.

So you put in your energy use and your square footage and your zip code, and it gives you a plot like this. It can give it for the total energy use, the electric only, or the gas only. And there's some statistics and there's some quartiles, so you can see what your energy use per square foot is, and what the median is. So there's 43, 35 and 67, give you an idea of how you compare. So this 38 means that, you know, they're between this 25 and 50 percent quartile.

So it's technical, I mean it's not -- engineers love it. The average schools principal wouldn't understand this at all, you know. So we know that we're not -- we have a first cut at information. And we need to tailor and layer the information for the right people. And we haven't really done that yet.

Now, California buildings tend to have good scores. And that's good. We think with title 24 and with all of our efficiency programs we would have hoped that our scores are good. What this plot shows is 100 CEUS buildings, and that 43 percent of them have greater than a 75 in EnergyStar. We found both with the schools and with the offices many years ago when we worked

with CEUS we found high scores.

And we talked with Bob about it. And they've made some improvement to the school. In the office building model they added heating degree days, so both CDD and HDD are in the model in the schools. They added CDD, so both -- in the regressions now, we spent a lot of time looking at how EnergyStar actually works. And how does it work for California buildings.

And we also saw, as Evan showed, that swimming pools were present in some of our schools. It helped explain high energy use. If the building has an electric kiln or a large kitchen. I mean the EnergyStar is a great starting point for an initial pass on how a building's doing. And it's important to understand what it can do and what our tool, with the simple EUIs, doesn't even do that.h

But, again, as we go into the future CEUS we're hoping to be able to dissect these end uses and understand them better.

This graphic here shows that we took a few buildings from the CEUS data set and we ran them through both CalArch and EnergyStar. Here's a building that scored very well. For EnergyStar

the higher your number is, this is a 98, for a 30,000 square foot building, and when you look at the statistics for the north coast climate zone, 79 percent of the buildings have an energy use intensity greater than that building. Okay, so it's somewhat similar.

Because that's what EnergyStar is, it's a distribution. It's a scale from zero to 100, and the 25 -- 75 and better means that you're in that best quartile of energy use intensities. And CalArch can give you something similar to that. That's the idea. Is that at a very simple level we can tell you, for your climate zone, if you're high or low compared to others.

We've been looking at different ways to display the data. And simple metrics are ways, and graphics are ways. And this is taking that same data and simply the energy use per square foot, this is site, but it can also be done in source. And the reason you want to do it in source is then it's a better measure of CO2 and the value of energy. So source units provide more relevance to policy level people. Site units are often more relevant to the onsite energy managers. So both units might be appropriate for different

audiences.

And if we put in these quartiles, green, yellow, orange and red, we can get some idea of how you are, a good building, a typical building would be a median performance. And you can see how you rank on a simple scale like this, again, for a climate zone. Doesn't correct for which end uses you have, and we'll talk about that in a moment.

Now we can turn this sideways, because I'm going to show you some different ways of looking at some of the data, just like Evan showed you all kinds of ways to look at the data.

I also want to show you the different building types. We linked back our building types to CBEC's, and these are the building types currently in the CalArch dataset. The sample sizes are quite small for some building types.

The new CEUS data with the 2800 buildings is a population (inaudible), so it essentially represents the entire commercial sector. And we can help you benchmark against, with the weights, essentially the representation of the California buildings.

So, the new dataset that's coming in

June is a great start for what we think can be done in the future.

But when we turn this sideways, I'm going to show you some other graphics where we look at energy good practice in typical buildings.

Now, I'm going to walk you through a few slides that introduce you to some of our ideas about where to take benchmarking for the future. And we talked about a layered approach a moment ago. The starting point is in energy use intensity, and we want to move down into end uses. We want to move it, because if you're going to identify the retrocommissioning or the retrofit opportunities you have to move into end uses.

And with these new simulations of the commercial sector we think we can start to do that. And the method I'm going to be showing you is based on a method being used in the UK by Bill Boardass who does the PROBE studies, and it is the method being developed in the European Union for the CO2 benchmarking that is going to be commercial sector benchmarking in all the EU countries. So we're trying to build on some techniques that we think lead us toward actions, that lead us towards identifying what we can do to

improve the buildings.

Our first level is the basic energy intensities. Then the default end uses. Then calculate your specific building's end uses. And retrofit and retrocommissioning options. So in the UK they're actually developing this fourth level now. They've done these different levels.

Now, this is showing you the kind of information that you put in at each of these levels. For initial feedback we only need the building type, the climate zone, the area and the total annual energy use.

Now we go into what end uses do you have. Do you have a swimming pool. Do you have a computer center. Do you have a kitchen. Do you have cooling. Because a lot of California buildings on the coast don't have cooling. So that's going to make a big difference on your energy use intensity.

Detailed end use characteristics will allow you to start putting in, building up characteristics. Those characteristics, themselves, are metrics, sort of benchmarking against end use characteristics. And then selecting retrofits.

And before you change that I was going to say -- yeah, go ahead. This graph is the energy use intensities by type and climate for different fuels, being site or source units. The key here is we're going to compare your building, whole building energy use per square foot, to a good practice building and a typical building. With these new simulations we're going to try to develop a good practice benchmark for each of the climate zones. Gas and electric separate.

So you put in information about your building and you initially get an EUI for comparison, are you higher or lower than this one, are you higher or lower than this one.

Now, again, I mentioned this is the UK/EU approach. And we now go into which end uses do you have. Do you have cooling; do you have cooking; do you have a lot of outdoor electric light.

So we start with your building with just the energy use intensity, but now you're comparison building has end uses. So the comparison building is a custom benchmark that relates to what you have in your building. So it's not just the average building but it's an

average building with services like yours. So it's a service to service comparison.

Go ahead. Okay, lighting. I was glad to see Dale's slide that shows lighting was one of the biggest energy consumption savers and peak demand savings potential end uses. This technique can also be done for peak. So while we're showing energy here, the peak watts per square foot on the hottest summer day is also -- each of these graphs can be exactly done for peak, as well. So we could understand the watts per square foot and the end uses that are helping us to see that watts per square foot.

Now, these metrics here, I do not show you an HVAC example here. I've shown you only a lighting example. And the lighting example is, of course, easier than the HVAC.

But let's look at the lighting. Power density, a control factor, a diversity factor, a main shift hours of use and a night load factor. This is one I want to comment on a moment.

So, we're building up from component information, we're building up a lighting energy use intensity. And we're thinking what are the retrofits and the retrocommissioning measures that

I can do to improve these.

And in this one I worked up in the northwest looking at -- some years ago, looking at the retrocommissioning -- well, actually it was new construction commissioning. And we looked at about a couple dozen buildings in detail what the commissioning agents did.

And one of the things they did after new building was built was they rezoned the lighting sweeps. So when, lighting sweeps now, they'll shut the whole floor off on a big office building. And it was a very common commissioning measure was to go back and rezone the sweeps. That means only the lights in your area go on when you override the controls at night. And that's an example of something that's going to improve this factor. So you can rezone the sweeps if that's a high number.

This is a lot of detail. And we know every building is not going to get to this level of detail. But we think this is a starting point for where we want to go.

So, CEUS already has a set of efficiency improvements built into those simulations. (inaudible) models, they have packages of retrofits; and they also, we can consider title 24

upgrades. And using code as a baseline.

So we can say how does the building compare, how it is today, and what if we brought it up to code lighting. How much energy might we save. And what are the characteristics when we retrofit it. We're going to bring down that nighttime use; we're going to bring down the lighting power density; we're going to improve the controls. And we're going to improve the energy use intensity. And we've shown it both in kilowatt hours per square foot and kBtus per square foot per year. So these are examples of the kinds of things that you might do.

What we get out of this is a before and after for your building. So your lighting energy uses come down and we've gone from -- we've reduced the energy use intensity by 3 kilowatt hours per year. We could calculate the watts per square foot, we could calculate the energy savings in terms of cost per square foot. And we could even potentially calculate a payback for the retrofit. It might be important to link this to the (inaudible) database and other data that we know about the costs of these sorts of things. So we ideally would link it to the utilities'

efficiency programs and help this be a tool that leads people towards participating in these programs.

So we have both the electric energy use kilowatt hours per square foot per year and the whole building kBtus per square foot per year.

Now, I just showed you what we called action oriented benchmarking, identifying the right actions. We also were thinking about a more simple energy use intensity tool. And there's various ways that we could do that.

One is by the one building at a time, which is what we currently have. Put your data in and you get some graphics out. But we also are considering something like a batch mode. And I think EnergyStar has that now. You can download a spreadsheet, put in 10 buildings, 100 buildings, 1000 buildings, and then upload that spreadsheet. And that spreadsheet gives you some graphics.

And then also this XML interface. And both EPA and LBNL have worked with internet energy information system companies. We've worked with Silicon Energy Interact, and we actually developed the CalArch interface so you could automatically, from inside your Silicon Energy system, or your

ITRON system, for example PG&E's Interact, would be a great place -- with this kind of data, and the energy use that's already in Interact, all you need is the building type and the floor area and the zip code or the climate zone, and you could automatically get this information because Interact could go get the energy data and organize it for you. And provide you -- email you back a spreadsheet; put it online. There's a lot of ways.

And the new thing that we all understand is that the new web systems and the internet systems computer tools allow us to handle data in a way that we weren't able to in earlier years. We're getting better at it so we want to go a little deeper.

So we have multiple modes of how to provide this link to benchmarking systems.

This is a sample of an input screen where, again, we have a few buildings, different climate zones, the area. This is a very simple tool. The annual energy use, the annual gas use. Go ahead.

And then you could get a graph like this, or you could get those statistics. My

building uses -- 75 percent of the buildings use more than mine. So we can get a simple review of how your energy per square foot compares to these various measurements.

This is my last slide, except for my sort of weblinks. So, we want to just say that the work that's been done is a great starting point for what California's trying to do. And we, both CalArch and EnergyStar show what can be done. They show some of the capabilities that are available today. And the coordination that we've had with them has been mutually beneficial.

Our understanding of benchmarking and their experience are a great starting point. We think there's new opportunities to improve the tools. And there's multiple modes that we can work with. And we really need to understand which market segments we're working with and how to provide this information to the right people.

Again, we have a strong interest in moving towards these action oriented tools and using the baseline of code for helping us understand that state of an individual building and the commercial at large.

And my last one is just some different

links: poet.lbl.gov CalArch and a variety of these things. And I think, Al, you're going to be posting these on your website?

MR. GARCIA: Yes, I am.

MS. PIETTE: So I'm sure you have questions but I guess we'll be able to talk about them in the afternoon. Great. Thanks.

Thank you.

(Applause.)

MR. GARCIA: Our next speaker is Bob Ramirez --

MR. RAMIREZ: Not yet.

(Parties speaking simultaneously.)

MR. GARCIA: And Bob is going to tell us a little bit about CEUS. I know that when I first heard the expression of CEUS, I kept thinking green eggs and ham and the cat that got the hat, or something like that. But I don't think this is what CEUS is about. And hopefully you'll clear that up for us.

MR. RAMIREZ: I will. But actually one of our programmers did take a few liberties with the S CEUS and the program that we use to process all this data is called Dr. CEUS.

So, what I'm going to do is just give

you, you know, -- you've heard a little bit about CEUS. I think hopefully everybody knows what it is. But I'm going to give you a quick rundown on where we're at with the California CEUS survey project, which there are, as you've heard, very high expectations for, and many applications and uses for the data.

So, a little background first. As you saw from Mary Ann's slides, there have been previous CEUS efforts. Typically they were done by each of the individual utilities, different end uses, different methods used, different times.

The need for a statewide CEUS effort was clearly evident. And so the CEC and the utilities decided to go ahead and do that. So we're doing a statewide CEUS effort.

The project was funded out of PGC funds. It actually began in 2001 and we will hopefully finish 2005. There's a lot of stuff to work through, so that's why it's taken so long. Survey form, utility frames, confidentiality issues. Some of that stuff that's going to be discussed later on this afternoon.

The objectives were characterized in the way the commercial sector uses energy, you know,

EUIs, again all the things that -- the metrics that have been discussed previously.

Many many uses. Primarily end use forecasting; assessment of energy efficiency opportunities; and one of the primary objectives was to provide a tool that could be used by the CEC for these tailored analyses, you know. Even for benchmarking studies, for anything else, but again the primary objective was to get this system that would hold all this data and could be used to do any number of studies.

We're doing 2800 commercial premises. That includes not only -- a premise, by our definition, is not only single buildings and, you know, part of a building, it includes large premises, campuses, master meter campuses.

We've developed a database, comprehensive database to contain all this data. As I mentioned, we've developed the tool, Dr. CEUS, for reviewing all these, automating the building simulation process, helping us to look at all the various inputs that we're using to calibrate the simulations. And do that pretty quickly.

You know, if you had to do this manually

it wouldn't be done for another five years probably. And again, once we get all the simulations calibrated then we can start looking at EUIs and, you know, doing various analyses.

Quick look at the distribution of the sample; 1000 sites in PG&E; about 1100 in SCE; 350 SDG&E; 300 in SMUD for a total of 2800 premises.

XnergyChema and ADM are doing the survey work. And again, the information is very detailed and Mary Ann's taking a look at the data. And you can kind of tell from her presentation what sorts of detailed information is there.

The building simulations, again 2800 premises. We've got 13 electric end uses and six gas end uses. We've also got, for the study we've got logger data, logger data for lighting and HVAC fans for about 500 sites, 500 premises.

And as I mentioned earlier, the information that we're calibrating the simulations to is 2002 bills, including demand, wherever it's a demand metered sort of a site.

We've got interval meter data for again probably about 500 sites. And we've got -- at some point we'll have the segment load profiles. So at some point we'll take the detailed building

level calibrated shapes and, you know, create segments, and then calibrate to segment load profiles.

And, of course, they'll be weather normalized. We're actually calibrating with the actual year weather, and then at some point we'll rerun all the simulations with normalized weather and have the results available on a normalized basis.

This is just a -- this is our primary, when we're calibrating this is one of our primary graphics that we look at in calibrating, one for the Dr. CEUS graphics. It's a four-panel shot of what we call the summary sheet. And it gives you a quick look at the simulation versus the monthly bills, the interval meter data. And within Dr. CEUS each of these four panels is actually a separate screen. So you can -- I mean here you can't really see it; you can see it when you print it out. But you can actually see it much better on the individual screen. Again, that's just to give you a quick look at the Dr. CEUS system.

Eventually, as I mentioned, we'll get to the segment analysis level. We'll take all the sites; build them up on a building type basis.

And we have very detailed, what we call site codes that go way beyond the normal building type classifications. In fact, I think that's some of the building types that Mary Ann had listed on her slide which came from the site codes.

So we'll eventually get to the point where we can do segment analysis and develop EUIs by building types. This just describes. Again, Dr. CEUS has a very nice set of graphical displays of this data. And the bullets just tell you about some of this.

And just a quick graphic of one of those.

Project status. We've got all the onsite surveys done. We've got about 300 simulations to go. And unfortunately those are the toughest, you know, the biggest buildings that have both interval meter data and logger data. And the calibration really is an art, so the more data, the longer it takes. So, by May 2005 it will all be over with.

The software is pretty much done. It won't really be done until we process every single site, but it's mostly done. And the segment analysis hasn't started, but by July 2005 we'll be

able to do that.

So, that's all, Dr. CEUS in a nutshell and the CEUS survey.

MR. GARCIA: Okay, Bob, thank you very much.

MR. RAMIREZ: Thank you.

(Applause.)

MR. GARCIA: Okay, now we have the other Bob. And Bob is with EPA. He came out here from Virginia --

MR. ROSE: I live in Maryland.

MR. GARCIA: -- Maryland, okay. Bob and I were talking the other day and he was telling me that he's a fisherman, he's a bass fisherman. I was telling him that some of the best bass fishing is out here in the Sacramento River. So maybe you'll come out and fish with us one of these other times.

But anyway, with that, Bob.

MR. ROSE: I think I'll follow Mary Ann's lead and try to speak over to the side there with the slide show, with Evan's assistance. That's why I was helping out earlier.

DR. MILLS: I'll be sure to jiggle the projector.

MR. ROSE: What comes around goes around.

(Laughter.)

MR. ROSE: Do you know where I'll find this, Al?

MR. GARCIA: There's a folder on the desktop.

MR. ROSE: Okay. Great. And actually, if I can borrow a pointer, or was there one up here?

Well, today's conversation so far I think has been excellent, starting with Evan's discussion of really just what benchmarking is or isn't is highly appreciated.

I wanted to spend a moment talking about what our benchmark does not do. We are a little bit concerned that there's a lot of excitement about benchmarking in California, and be a lot of weight put on that, and I'm here to tell you that benchmarking is not going to deliver, per se, energy reductions. It is a tool; it is a process people go through. I wanted to make that clear.

And, as well, I did not see Dale's presentation till today, but I thought that was very useful, as well, some of the feedback of what

people actually expected from benchmarking. We never actually went out and asked people what they expect. In EnergyStar we kind of just do it because we want to. But we did perceive there was a need. And it's good to hear it confirmed through Dale's work that some of those needs are what we're satisfying. And we had seen that, of course, in our own partnership. We have lots of partners we deal with. That's primarily how we got our feedback.

And Mary Ann as well, the fact that benchmarking can go further, in more detail, again is an excellent starting point.

Whole building as-built energy consumption against a peer group. That's what I'm talking about when I say benchmarking as we practice it now. We started six years ago or so. But that's what we're talking about. At the whole building level, how do you compare to your peer group.

We have coverage of about 55 percent of the commercial market. You can read those. What's missing predominately is retail, but the other biggies are in there.

Ratings take into account the size and

type of building, the hours, occupants, the climate, weather. Climate is the wonderful climate here in Sacramento; weather today was a little bit cooler than yesterday. That's climate and weather.

And also the fuel type we're using, source energy. Outside of California nobody does that. But we felt that was important as Mary Ann mentioned, correlates well with cost, correlates well with emissions, everything we do is forced energy.

And other parameters for hospitality, is it upscale, is it midscale. There's different amenities, other factors like that are part of benchmarking. That's what our system takes account for when you get this whole building rating.

And mixture spaces. If you have an office and a warehouse attached to each other our little system can handle that as well. It's not a big deal. But when users ask, can you do that, well, we have to respond.

And as well as you have different time of use segments, maybe a part of the school is used for a local community college, as well.

And also the ability to benchmark over time. As simple as that is, years ago users said, well, my area has changed over time; the number of occupants in my building has changed over time. So we now date stamp all the data. So when a user enters floor area, we also ask them, well, what's the date on which this floor area is effective. It's no big deal, but it's some of those details. Again, you learn through heartache to add to the system.

At times I feel like I'm not operating a 30,000 square feet for sure, not even 300 feet. I'm really below the ground being counted into it at times from people's expectations from our end users, if you could.

But, again, over six years we've had to add and make it fancy and so on. CBEC, it's important for you to know we're using a national data set. This is a national rating. And the commercial building energy consumption survey. They've gone through the eighth survey. That data's going to be released hopefully this year.

It covers about 5500 buildings nationwide, about 850 in California. Your new CEUS data will now surpass that. Currently the

national survey captures about the same number as the past CEUS data sets, but you'll now surpass that, which is excellent.

It has sufficient data for benchmarking. Floor area, occupancy hours. It has that type of information. If you ask CBECS, well, let's drill down more to get to the end use benchmarking, it can't do that. And we don't use it for that, and that's not the goal that we have in benchmarking.

That's not a limitation of CBECS, but it's something that is different from CEUS and the fact that you can then do a lot more with CEUS, but (inaudible). But that's the data set we're using.

The timeline, 1995 we were running what was then the greenlights program, which about three years after that would be retired. And we knew we wanted to get more into whole building performance. And we, ourselves, did not have a way to measure energy efficiency at a whole building level. And we had a lot of trouble with our partners assessing if a 10 percent improvement was good or not, depending on how good or bad they were to begin with. Ten percent, if you're a very high energy user, well maybe you could have done

better.

So, at the same time commissioning and those operations and maintenance were becoming an issue. So we needed something that went beyond technology. We all know that.

1997 we had an informal meeting at a PECI conference. We just got some smart folks together in a room, or at least said they were, and they proved to be. And we came out with mainly two basic approaches. Compare to code, we're familiar with that. And benchmarking, if you will, to a peer group.

We actually began in 1997 down the path of a better than code. We actually had an arrangement with PNNL. Earlier it was with LBNL and PNNL. But PNNL had a school that was deemed ready for the national market using ASHRAE's energy code. So we thought we'd do that.

We started to back away from that. It's not a comment on PNNL. We began to think, you know, we really wanted something that was using as-built energy data with this peer group. So we actually changed our minds midstream.

We talked a little bit with folks who were involved with what's called BEPS. If you

don't know what that is, don't worry about it. But it was something from the late '80s or so. And that didn't really prove to be useful, so we changed our ind again.

In 1998 we met up with Oak Ridge National Labs, Terry Sharp, presented a benchmarking paper. The Energy Information Administration, who conducts the CBECS survey was there. Well, in the next year we issued, or we made public the benchmark for office buildings.

We struggled through this a lot, is the point of this slide. And I hope it's the case, and I think I know the case now, in California you're looking at benchmarking because you've also struggled through various issues. You're looking to start up a whole building, so I understand it, the Commission, so I understand is looking that way. And then to go further.

So it's nice to see two separate groups converging on the same starting point. It's confirming for us.

Recent updates. 2001, we adopted in 1999 CBECS data, previously we were using the 1995 data. We're looking to get to the 2003, like I said. We improved the climate handling at the

suggestion of LBNL, and also the ability to handle swimming pools. You saw those same graphs today, also with Mary Ann.

We introduced in 2001 and 2002 (inaudible) that particular point is we're using industry data for that. We want to move away from that. But the bottomline is those two industries had the wisdom to do a survey of their own energy consumption. But they couldn't really figure out how to deliver that. So we assumed that data and made a benchmark available.

In 2002 we had modified our weather normalization routines. We're using routines that came out of Princeton with their PRISM model. If you don't know what that is, don't worry about it. But for those of you if that rings a bell.

The point is we're weather normalizing the energy data. We're looking at 12 months of energy data with 12 months of average monthly temperature, and how those months of temperature deviate from the average, we make adjustments from that. And that's something we borrowed from the research community.

And in 2004 we introduced the other building types that were listed. And in 2004 also

we retooled portfolio manager, that's the name of the online tool. And years ago we named that portfolio manager because we wanted to get to a point where people that own sets of properties were looking at the entire portfolio and trying to improve the entire portfolio. A little bit of foresight on our part.

But we now can handle default values. If you don't know the number of hours and so on, we'll default those sorts of things. You still have to answer floor area, that's a minimal.

Bulk data transfer, Mary Ann talked about that. And just for our end users, the ability to group buildings together. So, you know, show me all of my schools that are elementary, another group of their junior highs, whatever it may be. That's more end user type stuff, but it's -- throw money at it you can make the system do it.

Timeline, got to say, this IT stuff is wonderfully expensive. Future maintenance, certainly with the new 2003 dataset we want to update to that. That goes without saying.

We have a grant with the Energy Information Administration; that's an arm of the

Department of Energy, to help parse out maybe high schools from middle and elementary, thinking there's just another set of uses at high school level that you don't see. So that's a sampling issue.

Expanding into retail. Investigating the weighting factors, I wanted to spend a minute on this. In a moment we're going to talk about our end users experience with benchmarking, by the way. But I wanted to get through to you what benchmarking, as we practice it, is right now.

We've been told through an independent consultant we should have always been using weighting factors which weight the relevance of each building. Now, Oak Ridge was not using that in their -- when we met up with them. And we're not using it. With the old CEUS data, I understand that the weighting factors may not have matched, as well. Maybe that's not true, or it is. With your new CEUS you're going to do a good job with those weighting factors.

We've been told we should do this. And we've looked at it. And it looks to be more tentatively, moreso than tentatively so, that the effect is that higher scores go down. Now we're

very aware of the issue here in California is do higher scores on our rating motivate people.

We don't want to do this because it helps makes California happy. Let me add to that, just so you understand, in New York we're having the other opposite end problem where scores are low. And it also happens that these weighting factors make the lowest scores go up, which we don't want to do just to make New York happy.

We need to understand physically why this is happening. We've looked at every building type, office, retail -- or, not retail, office, K through 12, grocery and so on. It's always the case that the weighting factors, in the national data set, at least, have this impact.

We don't know why, but it could be an important improvement that might just happen to have certain effects that some of our market transformation friends think would be more appropriate.

Investigate additional factors were climate Mary Ann mentioned, some of the work she helped us with. I'm not convinced that we've fully captured California's climates. I mean let's just say if we don't capture California's

full set of climates I'd love to figure out a way to go further with that. That, in part, I think ha to be concluded; it swings some of the higher scores. Could also be your buildings are more efficient. Of course, that's rule in as a possibility. But you want that to be known on its own, not biased by climate effects.

And expanding to 100 percent coverage, we've had a number of end users who will benchmark their fire station because they just want something, they want a number. And we've been very fixated on, no, this is how we define an office; this is how to define a school. It looks like this and acts like this.

We've decided, fine, we'll give them a catchall category and they can have at it; for the purposes of EnergyStar you couldn't be EnergyStar on that scale. But that's been some of the experience from our end users that they want that. So we're going to do that.

And all the, you know, libraries -- not libraries, that's not an odd use, but art museums and so on. As soon as practical we want to give some regional information. That's why some of Dale's comments were very insightful. We've

learned that the hard way, as usual.

Partly at (inaudible) request, they've said, well, can't you at least help us to tell our constituents on a regional basis what their scores look like. And that's something we want to do anyway, and maybe that helps here, as well.

Some of the options. Many of our users think they're being compared to other users anyway. So why not let them know that compared to other users this is your score. And if you're going to do that, you can filter on a region or on a state or so on.

Another option is to, folks like NYCERTA and CEC to have access to our data and do your own carving and dicing and slicing of that data; come up with your own messages and so on and communicate that outwards.

And the third would be the inclusion of other statistical datasets. The purpose there wouldn't be to subsume CEUS, for example, but to the extent it adds a regional overlay of value we've now become interested in that. No one else has regional data, but you happen to have it.

Okay, so that's the historical, the updates and some of the future. Here's an example

screen. We're showing on the far -- that side, the right. Our focus here is really on getting people to improve, so we want to give them a baseline rating and ask that they compare themselves to that temporally over time. So we've built a system that encourages that. Not everyone does it, of course.

QAQC tracking. If you have missing data, if there's gaps in your energy data, we at least flag it to be aware of that. If you have a large occupant density, we try to flag that, as well.

The defaults, if you get a score with a default, it has these few little asterisks here. That's just telling you you're using defaults. The point I want to make to you is this system is up and going and we've been adding features to it, and we think there's a way to add other features; again these more regional things, for example.

And we can also give people different views and they can choose which columns they want to view. And they can export the data to Excel; it's all wildly expensive. Okay. I shouldn't say that, but it's very frustrating to timelines to get IT to work.

In EPA's experience the focus really should be this is a market transformation statement I'm making here. The focus really should be portfolio-wide improvements. There's a lot of buildings that are not owned as part of a larger set. But there's a lot of buildings which are. And we have counted from a market transformation perspective that that's where you want to motivate the improvements.

Benchmarking is effective in an overall context; again, because of our earlier presenters I don't have to tell you all the things benchmarking does not do.

The end users, they really value, we've found, the supportability of a number. I would argue that the visual plots are the way to go from a more technical perspective. But as was mentioned earlier, the principal of a high school is not going to understand that.

So they value supportability of this number we give them. It's a nonengineering unit. And that's something that we thought was valuable to them, for sure, that's why we did it. But it's been very confirming about that.

And, again, it lets them communicate

within an organization. The point isn't that they start spending tens of thousands of dollars on energy efficiency. It's for the first time someone from the maintenance level can have a conversation, or at least have five minutes of time with someone higher up, by the way, this is our rating. We've been working with our local utility, for example. We think we can get the overall portfolio average up.

And the person at the top can understand that, for those five minutes. And they move on to the next issue. But that's part of what benchmarking has become for us and our end users.

And many end users, they value just the weather normalization alone. The point being that, as Evan's point earlier, the extent to which we do not have benchmarking for energy is rather striking, to the extent people have sometimes flocked to the tools we have and others have just to get anything. Again, weather normalization. They love that. I'll put my fire station in. They really need this stuff.

So, we're problematically moving towards a continual improvement. We're more than this brand EnergyStar, we're a market for

transformation entity. And that's where we try to bring our partners. And that's, I would want to argue, is where CEC is going with this broad 20 percent goal by 2015.

Okay. So the users like having a standard. Got a lot of big names up here, very impressive. If you believe they're all reducing energy use, raise your hand. Of course not.

But these folks on this page, they represent end users who own a lot of property, or they influence a lot of property, such as Beaumont. Some of them are investment properties; some of them are building, are owner-occupied. The point is that they want to have some sort of standard. Again, one of the reasons you would do benchmarking.

So we have a challenge that we send out, improve your portfolio 10 percent of the time. We have a leaders program. If you do that, you'll get award at a corporate level. But the point is they're looking for a standard. And to the extent all of us in the community can do that, at the building level, and then at the sub level, (inaudible) level, I think it's going to be valuable. We've seen that. Okay.

The portfolio management and tracking is taking hold. Now, I did put CALPERS and CALSTRS up here because we're in California. But I wanted to explain what they're doing on this list. Again, I can't say they're proactive with reducing energy.

What they're doing in terms of portfolio tracking is in the case of CALSTRS, their policy is that every property they own, like these are pension funds and so they make investments. And a lot of that is in their diversification is real estate.

They've said that all property managers, and it's multiple property managers who manage property that CALSTRS owns, they need to benchmark their buildings every month. What they're saying is take the time and enter the energy data. And they want to see continual improvements.

And so once a quarter they expect a report that says our office building holdings are an average of X; last year they were something else. And the five-minute conversation, it'll not be more than that, is what are you doing to improve it.

Will they improve? I don't know. But

that's how they're using it. CALPERS is contemplating whether they're going to put all their real estate into this benchmark that we have. Again, for the same reason. They just want something at the highest level to communicate.

TransWestern Commercial Services, they've been using this rating to the extent a professional engineer validates the information in some of their real estate transactions. They have a lot of buildings that qualify as EnergyStar. They tell us they believe they can fetch a higher price for that. I don't know how they deem that. Personally, I discount that. I think in part it's just who they are and the quality of the properties they manage.

But what they're doing, nonetheless, is trying to incorporate this standard, this benchmark into their transactions to the extent it helps the buyers and sellers understand.

Arden Realty. This is an example. They have an EnergyStar building; 77 on a 100 scale. And it's gone up over the years to 88. We don't believe people who improve up the scale, then stop. We believe that once they do that, they're addicted and they want continual improvement.

The key question in California is what if you already start out as an 80. Okay. If you go from a 60 to an 80 we think you've got them on a track, they'll go further.

And then UAA Real Estate; we have a lot of real estate partners. We've gotten over with them the disincentives and so on that were perceived. They understand energy efficiency impacts their bottomline. They have an average score of 82. And, again, they're always trying to improve it.

In our experience a real simple metric energy per floor area is really not going to work. We tried that in 1995. We really did need something and we started there. And we just didn't see that it was working. We had too many people come back to us and say, well, what about weather, what about this, what about that.

So I know from today's presentations you're thinking maybe this is the place to start. Then you fold in hours and occupants and so on. And then you go to the end uses. Our experience is this may not be the place to start. I could be wrong. But our experience is if you can get people to pay attention to the energy per square

foot, and if they're really paying attention they'll ask questions. They'll ask about weather; or they'll ask about climate or so on. So if it's too simple we found it didn't work.

And then six years ago we were rather criticized for only having the frame which you saw earlier, operating hours, number of occupants, weather and so on. The concern was can you really take five or so parameters and rate the energy efficiency of a building. The jury's still out; maybe the answer's no. But that was a concern in the energy efficiency community six years ago.

And again I'm trying to push you a little bit here to convince you that again, this, I'm not convinced it's going to work to the extent six years ago, by including these factors, there was a lot of critique as to whether even that could be effective.

And clearly, benchmarking, as we practice it, needs to be improved, as well. But enough of that message.

And then maintaining and developing a benchmark is a process that takes a long time. Whatever CEC adopts, this is our experience as well, even if it's EPA's or EnergyStar, it's going

to take a number of years to get people into it and to get it going. That's a market transformation statement, again. That's not a benchmarking statement, per se.

I'm trying to sort of lower expectations a bit. But if you're going to -- if California CEC is going to get into benchmarking, just be aware you're really getting into something. It's very worthy, but it's going to take time and effort.

Okay, this is CEUS data that LBNL, Mary Ann had put together, some of her other reports. Basically showing that the scores are high. So, 67, 61, 66, 77 or 76. And then these are weighted, I think, with the floor area.

Anyway, I didn't come here to tell you the scores aren't high. And we're concerned the scores are high, but I'm also concerned scores are low other places. But this is the facts of the situation. Which, again, I want to further push ourselves to look further at the climate, for example. So this is well documented.

But I also wanted to show you some of the data that's in Portfolio Manager. Again, that's the tool that we have. There's about 1100

office buildings which have been entered in the system by end users. So there's no quality control, per se, on these buildings.

This is the plot you saw earlier; Mary Ann showed a plot that looked very much like that and Evan, as well. On this, this is the score from 1 to 100; 100 is the lowest energy users. Number 1, there's a lot of 100 buildings. We think some of those are just -- some of the energy data is missing. That's a common thing to see in the end users. If you don't enter all the data just four looks good. But some of them are just 100s. This is California office buildings.

I'm concerned of those that are 100s that this bar isn't down here. This is the 75 level. And this is a statement qualitative, but I ran some numbers, about three-fourth of the energy consumption of these buildings, by a set of buildings perhaps, about three-fourths of the energy use does not qualify as EnergyStar.

Your average is up here in the 60s, whereas the national average is seen to be a 50. Nationally about 95 percent of the commercial building energy use does not qualify as EnergyStar. That's why we chose 75, not 90. We

were going to go with the 90 levels EnergyStar, but then it was 99 percent didn't qualify.

UNIDENTIFIED SPEAKER: Can you expand on what you mean by qualify?

MR. ROSE: Yeah. I'm sorry. On our rating system, if you're at or above a 75 level you're deemed to be more energy efficient than 25 percent of your peer group, and you can apply for EnergyStar status, which means a professional engineer has to go in and verify it and so on.

So what I'm saying is 75 percent, roughly speaking, of the energy consumed by these buildings falls below the 75 mark. I'm being very direct. We believe, even though the scores are high, there's a lot of potential in California nonetheless to get these buildings to sort of cross this goal line. If you can get these buildings across the goal line, you'd make the 20 percent goal.

Now, from a market transformation perspective that's very hard, of course. But I wanted to put in perspective scores and what that can mean.

Next I'm going to show you schools. The purpose of this slide, and then I'll explain the

slide, is that the reason you also want to get into benchmarking, is you want to find anomalies. You want a benchmark that gets you to ask more questions and your end users ask more questions.

This is a great example. These are 429 schools in our system, and they're all stacked up at the high end. There it is, again, we're not being coy about it.

If we subtract the 200 or so that are in San Diego and Fremont, we get this. We get a distribution that's moreso across the board. I don't know the answer to this. But to the extent CEC wishes to have benchmarking, and benchmarking can happen and numbers of buildings get into it, part of the purpose is to go back and ask why are we seeing this. And that can lead to other questions. Climate can very much be a part of that. So I'm not discounting that.

But regardless of the scale you're using, to the extent there's enough data points in there, you can begin to garner other information. How you target your programs for utilities and so on. So that's the purpose of showing you this slide. We can already do that to the extent there's sufficient data in the system.

MR. DeLAURA: I know we're not really supposed to be asking questions, but on the previous slide where you show the trending of the buildings, (inaudible) -- when you're looking to the right of the vertical axis there, the 75 percent, do you have any statistical data on the grade of buildings, (inaudible) A grade, B grade, C grade buildings? Is there anything that --

MR. ROSE: Class A?

MR. DeLAURA: Yeah, is there anything in the classes of buildings that --

MR. ROSE: Well, for the office buildings class A dominates, because most of our end users own -- properties. The average size office building in the U.S. is about 20,000 square feet. The average size office building in our system is 200,000 square feet. So class A predominates of this.

And quite frankly, the class A properties, at least the ones we've come across, they're just sort of better maintained and operated. That doesn't mean you and I can't walk in and find opportunities. Good question.

So, now, so we don't dispute the existence of the higher scores. But we don't

believe end users will respond differently to these two plots. This is a CEUS plot; this is the plot of those office buildings.

This is a dual-edge sword. In part I'm saying, well, you know, is this going to motivate people. I'm challenging that, I admit that. But I'm also saying to you, we know there's people at the low end. We have to work like crazy to get them to approve. Okay.

And to the extent it's hard to get someone with a low score motivated to improve. We're not convinced that someone with a high score is going to be disincentivized to improve.

The other part of showing you this is not just to say, ah, you know, these are the same plots; it's to the extent this shows the similar information as this, if we can figure out a way to convey regional information about California buildings, that's going to be very helpful.

Now, I agree with Mary Ann that for me this is a far more telling story, the shapes of these distributions. But, again, having that number, that one little number, the score is an 80, is what other people want.

So we still have this problem that even

though the profiles are the same, nonetheless on this graph the average number is high. Again, back to that dilemma that we concede and we want to try to figure out.

Oh, and the little box was saying the CEC, that's important, if you can go back. It's that the CEC is in a position, I think, to set the expectations. Whatever benchmark it sets, it doesn't matter, CEC will have to say something to the effect we want this to happen. All buildings to go up 10 percent, all buildings to improve on the LBNL scale five bids over to the left, or all buildings on the EnergyStar -- whatever it is. So the CEC, ultimately, I think, is -- and the utilities, but I'm directing this to the CEC -- is in the driver's seat to set the expectation and the goals for any benchmark that you do adopt.

Just working together, I'm not convinced that we're capturing enough unique heating and cooling degree day zones in California. We have 20 or something like that, weather stations where we have degree day weather. It would be nice to have 100. We should keep in close contact with CBECS and CEUS data coming out. I would love to have access to CEUS, okay, that's -- there you go,

that's a statement.

But I'd love to have access to it to really understand more of the dynamics, what's going on. And I'd love to have, I say CEC, you know, (inaudible) now, but I'd love CEC to have access to some of the data in Portfolio Manager for the same reason, that they can -- you know, we have to protect users' identities -- but we can parse this data and find what's going on or how to convey messages.

We're going to keep the market transformation community up to date with the next round of updates. In the past they really weren't paying attention to benchmarking. And that's fine. You have to do something for a number of years to get attention.

But we're at a point now where we owe it to all the market transformation community members, well, we're updating our data and it means this for the scores. It means this for New York; it means this for grocery stores. That's just something we're going to do. When we tried years ago it was just, well, like, we don't want to listen.

We'd like to entertain a regional

aspect, again going back to Dale, independent confirmation if people want that. Working together to promote the portfolio approach, again to market transformation statement, not a benchmarking statement.

And utility data sharing, that's kind of a catch-all phrase. But to the extent any benchmark be tied in directly with the utility billing, where the end users at a local level input the local information, that's just going to help everybody.

I think that's it. Yes, thank you.

(Applause.)

MR. GARCIA: Thank you, Bob.

MR. ROSE: Sure.

MR. GARCIA: I just wanted to make an observation on the last two or three presentations. From my interactions with end users, utilities and other providers there's a couple of things that I don't think I've heard, or I haven't heard really very strongly said, and that is with regard to benchmarking.

You know, one of them is that benchmarking, at least, from the implementation point of view, it's a marketing tool. And, you

know, I can't underscore that strongly enough. This exercise is not a technical exercise; it's a marketing exercise.

The other thing is that in talking with a lot of institutional end users, one of the benefits they see of benchmarking is it allows them to prioritize and identify those buildings that, if they have a fleet of buildings, those buildings that need some kind of attention.

And the last point is that benchmarking, depending on how it's done, can be a very valuable tool in monitoring progress and keeping a record of what it is that we've done.

So, anyway, we have one last presentation and then we're going to break for lunch. And it's actually a dual presentation. And Martha Brook and Karl Brown are going to talk about West Contra Costa schools and some of the measures that they developed, if I'm not mischaracterizing that.

Martha is the project manager of a variety of different activities that she's supervising within the Public Interest Energy Research, and she's a very important part of this team. And, Martha, if you could --

MS. BROOK: This will be very brief because I'm very hungry. Karl, I hope you agree.

I think that's it, can you guys see that? Okay, so Karl and I are just going to talk real briefly about two examples of benchmarking that really applies to kind of pure PIER group. So I'm going to talk about K through 12 school benchmarking that we did a couple years ago; and Karl's going to talk about benchmarking within the University of California system.

In 2002 MIT worked with the West Contra Costa School District and PG&E to benchmark 49 schools; 39 of those were elementary schools; 5 were middle schools; and 5 were high schools.

And this is just an example of, you know, what you can do with benchmark when you're working really with a very focused audience and they want information about their schools. They don't care about the rest of California or the rest of the nation; they want to talk about their school district.

We were able to provide the school district with very useful energy use and energy cost comparisons so that they could make some decisions about where they should focus on the

energy efficiency improvements.

There's a report that's posted on our website that's part of work that we did under the high performance commercial building systems program a couple years ago. There's an attachment in the final report to that; the link is here. And it's entitled commercial building energy use benchmarking; it's one of the reports included in that pdf file.

The first thing, one of the things they wanted to look at is just absolute energy costs; gas and electricity. There's the 39 elementary schools, the middle schools and the high schools. Obviously they're different beasts. The high schools use a lot more energy and, you know, therefore it costs more.

Also you can see the difference between the natural gas and the electricity costs. Electricity is dominant, which is why source energy and costs, you know, compare so nicely.

Energy costs per square foot. This, you know, obviously normalizes things way down so you're looking, you're able to compare things besides school type. You're normalizing it by the square footage. And, again, gives you some useful

information.

That was costs, wasn't it? Yeah, that was costs. This is energy use. So, there's some striking differences between those two. This is, again, normalized, so you're not looking at costs anymore, just use. And you can see some definites. (inaudible) just keep popping up in all these graphs as outlyers, in all three of the school types.

But what the school district was much more interested in was energy use per student. And this, again, is a specific normalization that no other building type is interested in, but is very appropriate for school districts. And I should say that PG&E, and I'm sure other utilities that have school programs, are providing this type of information to school districts across the state, and they're finding them very useful to the school districts to start to look at energy in metrics that are important to them.

So, again, you see some real outliners in the information and, you know, a different metric and a different ability for them to make some, you know, judgments.

Again, this is all whole building, a mix

of buildings with air conditioning and non-air conditioning, pools and not pools, all that stuff's buried in here. But you can still see some differentiation. And that's, you know, when you're starting from ground zero, that's always important.

The other metric that they wanted to look at is the hours of operation. So you can see what it does right away to the high schools, it brings them right down into conformance with the other building types because their hours of operation are higher.

And then finally the combined students, energy use per student hour, so combining both number of students and hours of operation gives the school districts another metric to look at.

And now they have way too much information, right? So they have way too many graphs to look at. And so what MIT did for them is they combined all of those previous slides into this rank index.

So we're going to value costs; we're going to value energy use; we're going to value the normalized and absolute values of those. And we're going to value the other normalization

metrics per student and per hours of operation. And they combine that into this kind of normalized rank index. And this is what it comes up with. And in a couple more slides I'll show you an even more compelling slide because it sorts it, and you can see, okay, which ones across these are the ones we want to pay attention to.

They also did an EnergyStar on each of these buildings. And, you know, this obviously starts to, you know, to -- this is why Californians scream about EnergyStar, right, because everything rises to the top. But, you know, it's just a scale; and it's a zero to 100 scale. And if you had a different scale you'd see that same variability. You can see the same variability you see here; it's just it's sort of, it's dampened because of the zero to 100 scale.

But indeed, out of these 49 schools, 31 were 90 or above on an EnergyStar scale. So, you know, you start to think about messaging problems and those kind of things. But if it's only one of many things that the school district is presented, then maybe it definitely, you know, has value.

And you can tell from this slide that actually EnergyStar and the other metrics compare

well to each other. If EnergyStar -- EnergyStar is plotted on this line; price per student is the red line; and price per area is the bar chart.

If EnergyStar was a perfect correlation with the price per student they would be mirror opposites. And so you can see that there's actually quite a bit of good correlation where these lines go up, EnergyStar drops, and vice versa. So there's pretty good, you know, comparisons between those two type of metrics.

This is probably the most useful, in my opinion, of presenting information to a school district. So it's looked at all those metrics; it's combined it and it's sorted it. So it says, okay, across all your 49 schools, you know, here's again where you start. You know you start here and you work your way down. And that's just one example of something that California has done. And I think, you know, the utilities are continuing to do with schools and hopefully other building types and different sectors in the future.

And now Karl's going to talk.

MR. PENNINGTON: Question, Martha?

MS. BROOK: Yes.

MR. PENNINGTON: Where did you say this school district was?

MS. BROOK: West Contra Costa. So it's that -- Bay Area, and in fact, one of the things that the school district wanted the researchers to do was do weather normalization. So here we're thinking, okay, just one little, you know, climate. But they actually believe there's very significant microclimates within those school districts, and thought there would be value in weather normalizing some of those benchmarks. So that was interesting.

MR. BROWN: Thanks, Martha. Now, I do only have three slides, but one of them has an equation.

(Laughter.)

MR. BROWN: I'm with the California Institute for Energy and Environment, which is part of the University of California, Office of the President, a systemwide organization.

And I'll start out by saying that my colleagues on the nine existing campuses I think often use benchmarking on an ad hoc basis. That is, those of them that are lucky enough to have building-by-building monitoring. Because the only

thing that all of our campuses have is campus-wide building monitoring.

But, I think my colleagues are using benchmarking for all of these energy management purposes that have been talked about by all of the previous speakers.

However, our effort was one of the first to try and make sense out of the numbers from a systemwide basis. And we had a really compelling need to try to do that. And that was trying to plan our tenth campus in Merced. That campus was going to have some very strong goals for environmental stewardship, and especially energy planning and peak load reduction, goals which have been fulfilled in the construction of the campus.

And so I'm going to talk a little bit about the special uses for benchmarks going back to campus planning and design.

First and foremost is load projection. Planning of your infrastructure, get the size right, and to select the right systems.

The second is to set building performance targets in your designs. And we had a special need to do that in our sector for laboratories. But that crosses over to the

industrial sector, as well.

Calibrating building models is one very good use for the benchmarks we developed. And then in design review, providing reality checks on some of the engineering estimates that we would get for the designs.

Now, there had been a couple of efforts to do systemwide benchmarking in the past. One very important one by Paul Black at Berkeley. They've all had limited success because we have a number of these apples-versus-oranges factors that Evan talked about on our campuses.

One of them is thermal energy storage. This is the tank at our Irvine campus. Maybe half of our campuses have this providing a lot of good peak load reduction. We also have gas-driven cooling, and we also have cogeneration. And all of those things can really confound your benchmarking numbers.

So, one of the things that we've accomplished, and we'd be very happy to share, is methods for adjusting full campus energy indices to a standard case where you boil it down to a case where all your cooling loads are served by electricity and there's no effect of a thermal

energy storage or cogeneration. It's all about the loads. So we know how to do that now.

We've developed benchmarks for both electricity use and fuel use. And I believe that both fuels should be carried through in any database you're using. If you combine them into a single index that has some uses, but you lose information. So I want to carry both fuels through.

And while I'm really looking forward to the day when we go to time-valued energy use to recognize peak load and we eliminate demand charges in our billing, very confusing in a number of calculations, from an engineering standpoint and an infrastructure standpoint we still need to worry about maximum electric demand and maximum fuel load. Be able to size our infrastructure. So we developed those benchmarks.

And I put question marks here because this is the one where we had the shakiest data; it's probably the least useful. On the other hand, maximum electric demand was one of our most successful efforts.

And so here's the equation. And this isn't the only equation that showed up today.

Mary Ann, you had one on one of your slides, but I was very disappointed that you skipped over it.

(Laughter.)

MS. PIETTE: I'll go back.

MR. BROWN: Well, it's pretty simple, demand watts per gross square foot, three components, cooling, having to do with cooling design temperature; lab space and everything else, which is basically lighting.

So lighting's about .8 watts per square foot; you add an average amount of lab space into a building, another 4 watts per square foot. And then cooling is about 1 watt per square foot per 15 degrees above the cooling design temperature.

So that's a second innovation in doing peak demand, we use cooling design temperature instead of degree days for the correlation.

And the other thing that led to the success that we had was the correlation with lab space. No one had tried to map or correlate energy use with lab space. And this was a key factor in the success.

Now, --

UNIDENTIFIED SPEAKER: (inaudible).

MR. BROWN: Oh, okay, thanks. So if you

want to know the long story about this effort, there's an ACEEE paper that you can reference. It tells a lot more about what we did.

I seem to be the librarian for the day because I've provided the trailheads for getting more information on two of the areas mentioned by a previous speaker, Labs 21st Century benchmarking tool, and the PIER high performance buildings effort.

Both of these efforts have gone far beyond what we did on the UC systemwide basis. And these are much better references on a building-by-building basis.

And then lastly, back to what we're doing on our campuses for building-by-building benchmarking, along with Len Pettis from CSU and my colleague, Ann McCormick, is another contact for this. And Gene Rodriguez is on the schedule today. Is Gene here? Greg. Okay, there you go.

The investor-owned utilities are involved with this. But we've got a monitoring based commissioning program where we're installing more monitoring at the building and the subsystem level and using it for commissioning, traditional benchmarking use.

So that's all I have.

MR. GARCIA: Thank you, Karl.

(Applause.)

MR. GARCIA: Thank you, Martha and Karl. We're going to break for lunch now. And if it's okay with everybody, I'd like to keep the lunch hour down to 45 minutes. I know some of you guys are trying to get out on a plane later on today.

So, it's 35 after, and so that would be about 20 after 1:00, if we can get back over here and we'll resume. Thank you.

(Whereupon, at 12:39 p.m., the workshop was adjourned, to reconvene at 1:20 p.m., this same day.)

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AFTERNOON SESSION

1:31 p.m.

MR. GARCIA: This afternoon we're going to start off with the utility folks talking to us a little bit about their service territories and their customers.

My objective in asking them to do this is I want to make sure that people have an accurate picture of the target population we're dealing with out there. This is not -- benchmarking in the commercial sector is not a spreadsheet exercise. It's a very diverse, very deep and very large population.

Leading the pack is Gregg Ander. And Gregg is going to tell us about his service territory and his customers and all that good stuff. Gregg.

MR. ANDER: That's right, thank you, Al. Yeah, I'm Gregg Ander with Southern California Edison. So these next series of presentations I think will be pretty quick snapshots of what the various service territories look like, what's happening within the various regions here.

Southern California Edison, basically the southern part of the state, going up north of

Mammoth, down to kind of following the Colorado River down here, a lot of coastal area here. Roughly 50,000 square mile service territory; 4.6 million customers. Pretty diverse climatewise. We've got climate zone 16, which is 6 or 7 thousand heating degree days; up in the mountains; Death Valley; and lots of population and buildings along the coast.

Roughly 80 percent of the population is within 20 miles of the coast, also; kind of a rule of thumb when you look at distribution.

A little over 4 million customers on the residential side; commercial and industrial about a little over half a million, 550. Some ag customers, totaling 4.6 here. Annual kilowatt hours, sales, millions, 84-300.

A little bit about the distribution then in terms of these are just numbers of accounts; accounts equal meters for this data. So you can kind of see the spread here. Obviously lots of office spaces here.

Little clarification, these were mapped, our databases were mapped into the CEC building types, and some of them don't map cleanly. So, those that don't map cleanly, for example,

commercial other. Sort of what doesn't fit in these other building types get thrown into this bucket right here. And it's frankly quite a bit of them.

Little bit about activity. Historically we've set between 55- and 60,000 meters a year. Last year we set about 78,000, so it's a little bit higher. Although when you look at the distribution it's been pretty consistent about 11,000 new meter sets in the commercial area per year. What modulates is the residential based on interest rates and, you know, feast and famine and so forth. Obviously the residential market's pretty active right now.

And the other thing is that if you look at things like food stores, it tends to be not a lot of accounts, but pretty energy intensive. So when you look at energy uses by building type, you know, that pops up a little bit. Offices still pretty high, but there's an awful lot of them.

Refrigerated warehouse (inaudible) but pretty high intensities up here. So again, here's the distribution by energy use.

And if you look at kilowatt hours per account, again this is where the density comes in

right here, refrigerated warehouses 24/7 if you're maintaining, you know, 45 degrees or whatever it is, you have significant process loads here.

Hotel/motel, same thing, 24/7, pretty intense. And also if you look a little bit about the types of activity where we see a fair amount of increase, what comes to mind here is the K-12 school segment down here.

Statewide, the state will be spending about $50 billion a year for modernization and new school construction. Our service territory is seeing a lot of activity in that area, principally in the warmer areas, in the Inland Empire areas. Although Los Angeles Unified, which is the largest district in the state, with 800,000 students, they're growing, they're adding 100,000 students a year.

A big part of that is our service territory and then we share that with LADWP, who is also here. But a big growth area up and down the state.

Significant projections for office type space and retail, as well.

Actually that's all I have for this. This is for something else. So I'm going to turn

it over to Al, Lance, how do you want to do this?

MR. GARCIA: Yeah, let's have Lance DeLaura come on up. Lance is representing Sempra. And I guess you're going to be talking for not only The Gas Company, but also San Diego, right?

MR. DeLAURA: Yeah. Gregg actually made my job easy, at least for SoCalGas. Let's see, this computer is locked up here.

(Pause.)

MR. DeLAURA: Many of the things that Gregg was talking about are also true for The Gas Company. Just so you know, it was mentioned that I'm speaking for both utilities. We have a common management structure at Sempra for the two utility companies. So Sempra Energy owns Southern California Gas Company and SDG&E. And rather than duplicating the management structure and having different philosophies of operating, we use one common system. So I have the management responsibilities for both utilities.

As far as -- let me get started with San Diego here. San Diego is very unique. You know, I've basically spent a lot of my time in L.A., and going down to San Diego I'm just seeing the difference in the culture and the difference in

the construction activity, the difference in the values and the customers.

I would say that San Diego is very very green-minded. And when it comes to things like this initiative green-minded, in terms of energy efficiency and doing things that are good for the environment.

They're also very grassroots oriented, which is a good thing. Whenever we have -- there's a former San Diego employee here who's nodding her head -- whenever we have public forums, you know, we do things in L.A., as an example, just sort of a standard group of people that come in (inaudible); in San Diego we have business people, we get property owners, you get just a wide variety of folks. There's a lot of interest.

The reason I say that is I think this is an important initiative both for San Diego as well as SoCalGas.

As far as the breakdown of the customer base, you can see that we have about 1.3 million in meters. The difference for the disparity in San Diego between the gas and the electric is we have a considerable amount of people that have all

electric homes. And so that's the difference between those two numbers.

As far as the breakdown in terms of customer composition you can see that small, medium and large commercial. A lot like what Gregg was talking about where the lines are sort of blurred between those customer classes depending on office buildings that are going to fit into those different categories.

But I think what's important to look at on that particular slide is seeing the relatively to the residential base. You know, typically the residential base is the largest. And you can see that the commercial is very significant there.

As far as the breakdown of the subsectors of the customers I would draw your attention to a couple of areas here. Government 6.9 percent; it's third quadrant down. It's actually quite large. We have a lot of military there, as you can imagine, down in San Diego. So, I'm not sure if this particular initiative has any plans to address that, but I think there are some opportunities there. The military not only has the military bases, but they have a lot of offices, as well.

We have a lot of property management. There's a good deal of apartment buildings. And those apartment building owners, interestingly enough, also cross over into the office sector. So we've heard about Arden Realty or Arden Property Company. There are very similar companies to that that are headquartered down in San Diego that have interests there, as well. So I think there's opportunities for synergy.

Little more on the sector of breaking down into the food services, restaurants, you can kind of get the idea. But there are tremendous opportunities in San Diego.

To give you a descriptor as far as the service territory. It's basically from New Mexico border. We have a unique situation when you get north of San Diego, the actual Orange County/San Diego line overlap each other, all the way up to San Juan Capistrano we actually serve the electric side, and it overlaps with my other company, The Gas Company, as far as the gas. Gregg's company would be the electric provider in some of that southern Orange County area.

Moving on to The Gas Company, a little over 5 million meters there, customers.

Population is growing very much like Gregg said. There's been a tremendous boom in the residential as well as nonresidential activity. The reason that's important is wherever you have the residential activity occurring you going to see more business and more office space activity, as well.

Give a little more detail on the breakdown there. Same thing, very similar profile with San Diego in terms of the office space and the commercial space relative to residential. A great deal of opportunity, as a matter of fact.

I would say that we have done, I think, a very good job as a company as far as communicating with this sector of customers. So as we progress with this particular initiative, I think there's a great opportunity for us to be able to communicate to those customers about the benefits of the benchmarking; and also about the benefits of the programs that would develop around it.

Basically for Southern California Gas Company we're just south of the Hearst Castle all the way down to the abutment where we meet San Diego Gas and Electric, and then all the way out

to the desert. It is the largest gas company in the United States; second largest in the world. Second only to Tokyo Gas.

Any questions? Okay, thank you.

MR. GARCIA: Thanks, Lance. Jim Parks with SMUD.

UNIDENTIFIED SPEAKER: What about PG&E?

MR. GARCIA: Oh, I'm sorry, I skipped Peter. We'll catch up to you, Peter.

MR. PARKS: All right, I'm Jim Parks with SMUD. And compared to these other utilities we're relatively small, 900 square miles covering Sacramento County. We have a service territory population of 1.3 million. And we are governed by a seven-member board of directors. And we have revenues of around $1 billion.

We are a summer peaking utility, driven mainly by air conditioners. And our summer peak is 2809 megawatts. And that was back in July 2003.

We have 485,000 residential customers that make up about 44 percent of our energy sales. And we have 68,000 commercial and industrial accounts that make up about 56 percent of our energy sales.

Now, like Gregg pointed out, these are accounts, not customers. I think our number of customers, commercial, is probably about half that. Because you have many commercial customers with multiple accounts.

Here's kind of the breakout by segmentation. You can see the different number of accounts in these different categories. And these are kind of mapped in like a megawatt and above, 500 kW, 200 kW, and then the smaller ones.

Broken out a different way, you'll look, the number here is different. It says 59,560 accounts as opposed to the 68. We have about 8- to 10,000 unmetered accounts that are like night lighting and things like that. We know what the energy use is, we don't put a meter on them. And so this does not represent those unmetered accounts.

But by customer class this is what it looks like; and graphically here it is. You can see that the small customers under 20 kW make up about 11 percent of the commercial load. And then moving up to the 300 kW range, it's about 37 percent. And then on up to the customers over 1000 kW it's 26 percent.

What you wind up with in that classification is a relatively small number of customers making up a significant amount of our energy sales.

And that's it.

MR. GARCIA: Okay, Jim, thank you. And, Peter, I apologize for having skipped you. Peter is with Pacific Gas and Electric.

MR. TURNBULL: So the smart thing for me to do would be play with this for a minute and say, ah, I can't get it to come up; I'll just do it verbally. So, that's what I'll do, except I'll skip playing with it. I was kind of a last-minute pinch-hitter, so I don't have PowerPoint slides.

Demographically Pacific Gas and Electric is -- we serve about 13 million people, so service population of the state population is what, 35 million, so we're right around a third of the population of the state.

We're in 48 out of the 58 California counties, is what I'm recalling there. Of the 16 climate zones I think it is, we have, I believe, 13 of them. So PG&E is -- it's probably difficult to generalize about anything in terms of demographics, where you are, climate, anything

else, as far as Pacific Gas and Electric goes.

In terms of spread of the customers, as with the other utilities, there's a relatively small number of big accounts. I don't think there's any big surprises there. Our demographics of how much is food service, how much is grocery, how much is office is going to mirror the state and the nation pretty well. I don't think we'd be different than Edison in that respect.

So I would just say those things, service territory-wise, geographically we're maybe on the order of maybe twice the geographic size. And then business-wise, maybe slightly larger than Edison I guess on the electric side, or about the same as Edison electric.

We have gas, as well, and so that -- combined revenues then are a little bigger probably. But so that's sort of the snapshot.

Am I allowed to say anything about the commissioning part of this?

MR. GARCIA: Sure.

MR. TURNBULL: Okay. I've got three or four things I'd like to kind of throw out there about the commissioning. It was good to hear all this material this morning. I'd be a strong

supporter of working with EnergyStar on commissioning. I think that's a real important thing.

We see tremendous value to EnergyStar as a branding technique for a lot of our programs. I believe Edison and the other utilities would echo that. I see Gregg shaking his head there. So I think that's a really crucial point.

I think that the credibility of that system, though, is going to be very very important. And I think everybody's saying the initial efforts are maybe not completely there. And where this starts making more of a difference or a different kind of difference to us as a utility is that we're going to tell somebody to spend money. We're going to say spend money, lots of money, on this system upgrade. Spend money on windows, lighting, whatever.

That credibility thing, so to speak, then becomes maybe an order of magnitude more important compared to simply a benchmark. But we're going to talk about, you know, we think you should invest X amount of money in doing this specific project. We'll give you a rebate. The rebate will be a big amount of money. I think I'm

speaking here for the other utilities, as well. We all have large rebate programs.

So the concept of this thing being something we can really bank on and be credible, which I think means regionally focused and having a lot of regional credibility, I think is real important. So I think I'd maybe say it like that. So, that's something I think is real important.

We would see it as a point of entry into commissioning programs that we might support our offer ourselves and work with partners to offer. We would also like to see commissioning moving very much in the direction that Karl Brown was talking about in terms of this monitoring-based commissioning which means you have a meter there and you know what actually happens. And you have a meter there and you know what went wrong a year later. In other words, some sort of monitoring device is there and is providing kind of a continuous feedback.

So I would see us moving in that direction; and I would see the benchmarking CalArch, EnergyStar, these kinds of tools being kind of a great here's where we're starting; let's

refine this; let's drive customers to take action.

So, that's my list. Those are my slides. So --

(Laughter.)

MR. TURNBULL: Okay.

(Applause.)

MR. GARCIA: Peter, can I ask you a question? Because I don't think I caught it. Do you have a feel for how many commercial customers you serve?

MR. TURNBULL: Yes, 450,000-odd. In that range --

MR. GARCIA: Okay. Thank you. Okay, and the last utility speaker I have here is Gary Gero. Did I say that right?

MR. GERO: Gero.

MR. GARCIA: And he's with DWP.

MR. GERO: I'm not SMUD. Any idea where these are loaded?

(Pause.)

MR. GERO: Good, thank you. Gary Gero with Los Angeles Department of Water and Power. I've just got a couple of slides; I'll go through it quickly, as well. I know we want to get on to sort of more of the business portion of the -- I'm

not very good at this, am I? -- the business portion of the meeting.

Broad overview. We're about 465 square miles; saw Jim's presentation, he's 900. We're about half of, sort of size-wise, of SMUD. We have 3.8 million residents in the City of Los Angeles. We also serve the Owens Valley, both water and electricity. 1.4 million customers; of that 1.2 million are residential and .2 is nonres.

The energy use profile, I'll quickly go through. Residential is about 30 percent of our load in terms of actually energy deliveries. Commercial is about 50 percent. Industrial under 12. Other categories under 10.

Our peak demand was just over 5400 megawatts. We have, I think, installed capacity something on the order of 7000 megawatts. So we're capacity rich.

Residential profile. You can see it's about a 40/60 split between single family and multifamily. The multifamilies range, of course, anything from two to four units, all the way up to hundreds of units in a multifamily building.

Quickly going to go through the commercial and industrial customer bases. Again,

you can see these are just based on SIC code, essentially. We did some combining for the other because agricultural and mining and construction were not considered big pieces.

Manufacturing, 18 percent. That is declining. The manufacturing base in Los Angeles was higher at one time, but still a very significant portion of our load.

Transportation/communication, you can see the retail sector. The service sector, of course, is the big one, you know, your restaurants and all of those things. So you can see the breakdown there.

Let me just quickly go through some of the summary. We're projecting about a 1.3, 1.4 annual load growth at this point over the next 20 years. Again, I mention the industrial growth is declining.

There is a high demand for new housing, however Los Angeles is essentially built out. There is not production housing in Los Angeles that way you find in other areas of the state. So any of our housing developments is going to be just turning over the existing housing stock for the most part. And building up, which is, you

know, going from single family to multifamily units.

We are seeing quite a bit of actual new housing being developed in the downtown. Old commercial buildings that are being converted into loft-type living spaces. And so that's probably going to be the fastest growing in terms of new housing in the Los Angeles area. And that was actually helped along by an adaptive reuse ordinance that was adopted to specifically encourage the reuse of commercial buildings, historic commercial buildings in the downtown core into residential.

And so these buildings are going to be kind of interesting in terms of what they do from an energy standpoint. Because probably most of them still have operable windows and that kind of thing. So they're not going to be sort of your traditional new housing developments.

It was mentioned new schools. LAUSD is embarking, they're in the midst of a multi-billion dollar new school construction program. So we were going to see, I think we're going to see at least 20, or maybe 30 or 40 new schools in the City over the next few years. They're sprouting

up all over. And again, you know, it's not sort of greenfield school development; this is taking existing commercial areas and either taking down a building and building a new building, or reusing an existing building.

We have adopted an RPS so that's going to look at, just in terms of our load growth, the RPS will probably cover most of the load growth. We've set out a goal of 13 percent by 2010, and 20 percent by 2017.

Now we do, contrary to popular belief, or some people's belief, we actually do what we feel is a fairly aggressive energy efficiency programs. Of course, we could always do more. Our goals this year are for about 14 megawatts of peak reduction. And that's been pretty consistent.

The goal in our resource plan was for something on the order of 145 megawatts of peak reduction over a ten-year period. We are updating our integrated resource plan, however, so that goal could change.

And with that I will conclude and let us move on.

MR. GARCIA: Thank you, Gary. The

next --

(Applause.)

MR. GARCIA: The next part of the workshop, I've got it divided into various themes. And the first part has to do with target populations. So this is a good introduction to that.

Part of my, as I said before, part of my intent having the folks talk about their service territories, so that we can appreciate the diversity that each utility has. You know, one utility is not just like the other utility. San Diego is very different from PG&E, which is different from Edison, which is different from DWP or SMUD. And I don't think I saw anybody here from IID, but they were invited. And some of the other munis, as well.

But it is a very diverse population. I also said earlier that as I see it, this thing, this benchmarking, the goal which is to cause benchmarking to take place in all commercial customers, and fortunately it doesn't have a date, but other than 2015, it's a big job.

And it requires a special approach. One of the things that I was doing while folks were

talking here is I was tabulating the number of customers. And if you combine gas and electric customers in the commercial sector the utilities are serving it's something like 1.5 million customers. For only looking at the electric customers. We're looking at about 1.2 to 1.3 million customers. That's a lot of customers, a lot of customer.

And, you know, it dictates, or at least limits us in the types of tactics or strategies that we can utilize in order to achieve this goal, you know. It is not a spreadsheet exercise. It is largely going to be -- if we're going to do this, it's largely going to wind up having to be some kind of an IS approach.

We, you know, take advantage of the fact that the utilities have at least half of the information, that is the energy usage information. And if we can combine that with, you know, the customer-specific information, we're almost there.

Anyway, I had prepared a whitepaper in which I had raised a number of questions. And I thought that we could start out with talking about, you know, the target population. Let's hear some questions, comments, besides my own

here.

Yes, Gregg.

MR. ANDER: Just a kind of editorial comment, -- after what Peter had mentioned before. The utilities are really interested in this as a benchmarking exercise (inaudible) opportunities. Through Art's and others' leadership we have this action plan in place which enables us to put together these aggressive efficiency programs.

So to the extent we can use the benchmarking tool to help (inaudible) these opportunities and guide them towards the various programs that are in place, you know, to help us figure out various statewide goals.

So within the various organization there's account management teams together, you know, by market segment so specifically craft delivery for, you know, certain segments, whether it's school or office building or, you know, retail, et cetera.

So what we're hoping is that we can package that with existing, you know, programs and delivery mechanisms, again, to feed these programs and get these real aggressive goals. So we see it as a tremendous opportunity.

MR. GARCIA: I agree, Gregg. I think the potential synergy between or with the existing programs and the utilities and benchmarking is just tremendous. I also feel very strongly that those that are going to be delivering the benchmarking information to their customers need to have a flexibility to be able to tailor that information to the customers. We can't do that in Sacramento.

And it's, you know, largely the utilities that know their customers. They already have customer/client relationship with them. And I see that as probably the way to do that.

MR. PETTIS: I'd just like to -- Len Pettis with Cal State system, and like Al, we have campuses in every one of the utility districts throughout the state. Some of our other state agencies represented here.

I think I speak from a common voice if I were to ask that the utilities, whatever you all agree on, please make it the same so we can all go to the same standard. I know you don't agree on, and you shouldn't because you have your own customer bases, you have your own building methodologies and rate structures and so forth.

I'm not asking you to change that, although that would be nice.

But what I am asking is that when we come out of this with some benchmarking criteria, that it be uniform throughout the state so that everybody can understand it. Even though there's different climate zones, even though there's different characteristics about where we're measuring our energy, I think it's important for those of us that have businesses, such as I've worked in the commercial building industry, too, and they have building facilities throughout everyone of the utility districts in the state.

The same goes for universities; the same goes for state agencies. So I think I really would ask you if you'd all work together and come to a common ground on what the benchmark criteria is for us to look at.

MS. BROOK: I wanted to ask a clarifying question. Do you think that commonality needs to be within the sector, like the CSU system, the UC system, or across all building types, sectors?

MR. PETTIS: That's an excellent question. I see it, and I'd like to hear Al's comments and Art's too, as well. You folks have

been around for a long time.

What I see happening, in working with the other state agencies, what I see happening at CSU and UC is that we are moving towards, and really being forced to in this environment by our, you know, being mandated by our trustees, to operate and function like a business.

And so to answer that question I would say at the highest level, yes. And that's one of the reasons I ask for a standard. We see ourselves, our campuses as operating like large commercial buildings. And having worked in K through 12 I see that as operating much like small box retail in a sense.

And so I think there are some commonalities in terms of how the buildings operate and behave. And I think it would be good to work towards that model of having a business model. I think that's the responsible thing to do.

MR. GARCIA: Let me make one comment and then I'll come back to you.

I'd like to actually hear from the utilities regarding their reaction regarding that point, and regarding, you know, how much sense it

makes to tailor, being able to tailor the message to the customer.

And before --

MR. BROWN: Karl Brown. To answer Martha's question, to complement what Len said, some of our facilities look like K through 12 facilities. Some of our facilities look like sporting facilities. Some of ours have overlap with the industrial sector in laboratories, with the health care sector in our hospitals.

So I think there is worth to having a commonality beyond our specific organizations.

MR. GARCIA: Okay, Lance.

MR. DeLAURA: I think I can speak for the California utilities, plural, that would include the munis, that there has been a much stronger focus, especially in the past few years, for us to bring together on more of a common basis, delivery and programs; communication of general messages to customers where you can get into a little bit of difference by specialized communications, depending on what your geographic needs are.

But in terms of delivery of programs, in terms of the commonness of timing, commonness of

message, especially at a high level. I think I speak comfortably for everyone that that's our intent to do that, so that should not be a difficulty.

I think the challenge is going to be that as we move forward we need to have a message that's meaningful to customers that they're really willing to identify with. I heard this a little bit earlier today about okay, so someone's got this benchmark. Now it's going to cost them some money if their number is low and they want to get to a higher number. We have to be able to provide valuable information that really gets people to do that.

And for the utilities, we want to be seen in the role of being helpful to the customer, providing them with quality information that they can use to make better business decisions.

And I think we rely on this group, certainly the CEC to work with us to help to develop those messages.

MR. GARCIA: I actually want to dig at that a little bit more. Let me give you a specific question. How would your approach differ, if any, for say a corporate office

building operator versus say a high tech facility that maybe is a server farm or something like that, that is owned by a company like Microsoft?

MR. DeLAURA: I think that the front end of it would look very similar. That would be the business case, the business case of saving money, being good to the environment, being a good corporate citizen. Those types of (inaudible).

Where it would differ would be where it comes to the benefits specifically for that customer. So you mention a computer farm; there's other considerations that that particular sector might have in terms of protection and maintenance of data and security that maybe others wouldn't have such a strong -- so that would be a nuance, and hopefully that's not a large issue. I think that's a marketing nuance where you're really trying to speak the language of that particular customer so that you can communicate with them.

MR. GARCIA: All right. I thought I saw a hand over here. That wasn't you, Evan? Okay.

COMMISSIONER ROSENFELD: Well, I'll make a comment.

MR. GARCIA: Yes.

COMMISSIONER ROSENFELD: I'd like to get

back to you utility folks a little bit more. I think that over the next few months my guess is that the lead work is going to be at the CEC and with EPA digesting these new attractive databases.

But when it comes to putting those into a tool, two remarks. First of all, somebody in the last few minutes, I've forgotten who, said I really want to see it called EnergyStar because I like the brand name and people will listen to it.

And I want to say amen. My personal prejudice is I don't really care what the tool is; it'll be some hybrid of what exists now and newish things because we have interval meters. And it's not going to look very similar to what we have today.

My prejudice is of course we call it EnergyStar or CalEnergyStar or something. I mean, what the hell, if people know a brand name and respect it, we ought to take advantage of that.

And I think it's also everybody's intentions are that it should be uniform statewide. Maybe Bob Rose would say countrywide; that's up to Bob.

What I'm a little bit more concerned about is that the client, the direct client for

this seems to be pretty clearly the utilities. Now, they, in turn, may decide that it's such a great tool they will encourage all their ESCOs to adopt it, or whatever. But the client for how it's going to be used and is it useful is the utilities.

I don't think we're very well organized on that yet. I have a sinking feeling that the utilities are still saying, well, there's a year's work to be done; we'll let the CEC and EPA and so on do that. And then they'll deliver some nice shiny thing and we'll use it. And I don't think that's the way the world works.

I think we need to get one point person at at least the three big IOUs, plus I hope SMUD and LA and so on, to be at least a very active advisory committee and pay some attention to this. Because you're the people who are going to have to be enthusiastic about it, put it into your budgets. We can do kind of R&D; we can't deliver anything. We're just an unfunded mandate.

So one of the things I think has got to come out of this afternoon is utility representatives and maybe some discussion, maybe somebody who makes up budgets like Gregg Ander

will tell us where he is in thinking about how you make sure that all of the budgets are going together by June, I guess, for the three-year cycle of '06, '07 and '08, there really are resources for doing benchmarking and connecting that with commissioning and so on.

So I'm mainly voicing concerns up here.

Gregg, do you -- where's Gregg? I can't see him.

UNIDENTIFIED SPEAKER: I think he's out of the room.

(Laughter.)

UNIDENTIFIED SPEAKER: No wonder you can't see him.

MR. DeLAURA: I guess I'll take a stab at it again.

COMMISSIONER ROSENFELD: Please.

MR. DeLAURA: A couple things. One, in terms of addressing the question about having a point person, I think Al did a very good job of mining, at least my utility, my two utilities, to figure out who the person was. And actually my assignment came from my senior vice president to be assigned to this, to be the point person (inaudible) so I can speak up for my two

utilities.

As far as the issue of budgets is concerned, that is an aggressive issue that's going on right now for the IOUs at a minimum because of the planning cycle for 2006-2008. And my initial comment, without seeing the detail, we need to see what's involved to do this so we have a better understanding of what is it we're looking at as far as budgeting, because that budgeting is happening right now.

We're looking at getting any and all cost effective savings into our energy efficiency portfolios. And what we're doing is we're building budgets around that, for widgets, for education. Primarily widget driven, though. It's things that you can say you're (inaudible) a dollar; you're getting a certain amount of benefit for that dollar. So that exercise is going on right now.

And I would say that from a timing perspective of the utilities we're looking to have our filing certainly by June 1st. And just backtracking timewise against that, really May 1st is when the utilities pretty much have their ducks in order. Because there's an amount of time it

needs to go to the regulatory departments. They need to make sure everything is proper so it gets massaged into CPUC-speak.

So the sooner we can do this type of planning that we're talking about today, the better, so we can take that back home and test that against the priorities of the energy savings. And hopefully we're able to say this is one of those types of measures that is energy savings -- directly correlate to. It gives it stronger prominent in budget that way.

COMMISSIONER ROSENFELD: Bill Pennington.

MR. PENNINGTON: Bill Pennington with the Energy Commission. Just to follow up on that, it seems like to me that utilities would need to try to have some placeholder in their 2006-2008 planning for this.

And I thought maybe it falls in the education program category or not sure quite where it falls. If you can't associate energy savings with it, then it's a struggle. But it seems like you ought to be thinking about this is coming and, you know, maybe not as fully defined yet.

So, I don't know.

MR. GARCIA: Did you have a reaction to that, Peter?

MR. TURNBULL: We expect to have -- we have commissioning activities for existing buildings, you know. We believe we'll have a fairly substantial retrocommissioning type of program.

Now that's -- we're kind of coming from the other side of benchmarking. So, in other words, it's not a benchmarking program, per se, but a program to go in and say essentially, call it -- we're going to tune up the building, we're going to retrocommission it, you're going to do a fancy audit -- but you want to do some activity, benchmark the building at least against itself, then take action.

We're expecting to have (inaudible) program in that area. I'm not involved in the budget discussions day to day, but that's what I expect to have happen.

The front end part of it, like deploy to large numbers of billing customers we talked about, I mean I'm sure we want to start with the biggest ones. I think there's some developmental work, right? I guess that's why we talked about

placeholders. That maybe we feel like still needs to happen. But I think we'd like to be very involved in that.

But in terms of what will we do, in terms of transactions and stuff that gets savings, we would expect to have a lot of retrocommissioning, a robust program is what I would anticipate, which is not, you know, I'm not committing to that, but that's what I believe will be happening.

Maybe, Lance, if you have anything to --

MR. DeLAURA: I think the key is really just getting better understanding of, as I mentioned before, the level of funding that we would need to be able to build around. That's really the key.

You know, the willingness, the want, the desire to (inaudible). So now the question is just figuring out the magnitude and the timing of when that would occur, and then building that against the other priorities of the money (inaudible).

But the sooner the better that we can do that. It would really be helpful in the next couple of weeks that, at the most, to really get

our arms around that and have at least a good sense of what that would be.

MR. GARCIA: Let me add some fuel to this discussion. Part of what I was trying to do was give you a sense of what the size of the target is. And we basically have to get this thing going in fairly short order so that by say 2010 the buildings are relatively on their way to being benchmarked.

Because it's such a large number, and because it's not something that is easily done in a spreadsheet, at least the conclusion that I've come to is that it has to be some kind of a pretty large IS effort.

And for those of you who have messed around with IS, nothing's cheap. And, you know, potentially on an aggregate basis we could be talking about $100 million investment.

I was hoping to have the PUC here today to engage them, or at least start engaging them in this discussion. Because let's say that in order to deliver this information to the customer you've got to go in and start messing around with your customer information system. That would require a large capital investment. And how are you going

to recover that investment?

You know, one way -- I can think of at least three ways. One way would be through PGC dollars. Another way would be to ratebase that stuff. And yet another way would be through procurement costs.

And, you know, one of the observations that Art made was that, gosh, at the very least you've got to have some kind of a placeholder in there to cover the things like programmatic costs, the marketing end of things. That makes a lot of sense.

But we need to start engaging the PUC in trying to decide how these moneys are going to be recovered. You're not going to do it for free.

Yes, Martha.

MS. BROOK: I was just going to say that --

COMMISSIONER ROSENFELD: Martha, yell a little bit louder.

MS. BROOK: -- assuming one type of delivery model, and that's like through the customer utility bill. And I don't think we necessarily talked about all the possible options. And how, actually, strategically we reach 1.5

million customers.

I guess in my mind there's a lot of different options like going directly through utility programs and retrocommissioning activities. We wouldn't necessarily do it through a utility bill type of marketing (inaudible).

So there's --

COMMISSIONER ROSENFELD: Martha, I don't think Al meant to say whether it would appear on the bill or not. I think what he said is we don't have our act clearly together. In terms of utility budgets, I think Al said there are three conceivable things.

One is it just comes out of the public goods money. And then Lance just told us but if we're going to do that, he has to submit preliminary budgets by like the first of May, looking a whole three years ahead, and that's hard.

Or it could come out of operations of the other extreme, where it's just money that the ALJ approves of, but it comes out of customer rates.

And then in between there's this business of is it a capital investment and so on.

But, no one suggested -- I mean maybe it's a good idea, but I don't think anybody suggested that bill stuffers were the way to do it.

MS. BROOK: I guess that's what I assumed when he talked about the major (inaudible) utilities.

MR. PENNINGTON: So maybe I could -- I've heard these people talk back and forth, so --

COMMISSIONER ROSENFELD: You're tired of it.

MR. PENNINGTON: No, I'd like to, you know, clarify maybe what I'm hearing.

I think Al in particular sees a process where there would be information systems base delivery of this that would be associated with the utilities; online information to customers; online interaction with customers. That billing data for each customer would be accessed through some sort of online -- and I think that's really what Al's talking about in terms of an IS system.

Maybe it never would be on the bill, itself, or if it would, it would be some short version of it. Kind of hard to see how that would work. But, I think Al is thinking about this is a regular thing.

Another advantage of that kind of an interaction is perhaps it could be a -- you could periodically do it, instead of it being a one-time thing, it perhaps could be done monthly or there would be a check in. It could be tracked monthly and then updated monthly.

So I think that's one thought process for how it might be delivered. Is that right, Al?

MR. GARCIA: That's pretty much right, Bill. And let me just clarify. What I said was not to the exclusion of any other methodology, because I think there are a lot of very viable methodologies that, in my opinion, the utility or whoever the delivery partner is should have the flexibility of being able to use it. That makes sense.

Okay, and I saw a hand over here.

DR. MILLS: I was just curious, how many of the utilities, if not all of them, already have web-based portals for their customer, self-authorized customer, to get their data (inaudible).

That's a great thing. This is some years ago, of course, (inaudible) --

MR. DeLAURA: I guess I was thinking of

sort of a hybrid of the two, just to (inaudible) an idea here. I know that EnergyStar, as an example, you were giving an example earlier of 1995 and some other efforts that have gone on. I remember working with Julio Rovi, Rovi, at one point.

And it seems, that's another idea, it certainly isn't an exclusive idea, but if there were a way to centralize the ability to benchmark data and the utility could act as the -- to point you to getting that data.

In other words, we have the trust relationship with our customers. They look at us; they do the things we tell them because of this trust relationship. So if we can get their attention with the fact that this is a good thing to do, and we can provide maybe a variety of resources, maybe it's a modeling tool that's in a centralized place, that someone can access their billing data and match against. Where it's not so utility intensive, where you're having to do this IT exercise with the utility, that it becomes more of a central depository as far as benchmarking data. And you're pointing the customer to do that and then (inaudible) billing information --

MR. PENNINGTON: I think that gets into a (inaudible) issue pretty quick, or how do you share that customers' data into the (inaudible).

MR. DeLAURA: (inaudible). I guess maybe the way I was thinking of it is first a customer's getting access to their data. That's not a problem. They have the authorization to do that.

In terms of the benchmarking, the benchmarking isn't necessarily specific (inaudible) a class A building, you're in this region. And you're comparing yourself to other class A buildings in this region, it doesn't necessarily have to mean that you have an address for the other buildings.

But it's just seeing what your building performance is, and then it's providing the primer for someone to say, okay, wait a minute, I'm a 13. You know, I should be a 60 or a 70 or an 80 here. And then some suggestions that could come their way on ways that they can improve that number.

It seems to me that's sort of where we're trying to evolve to. And I think there's softer ways to do it without having to initially create a whole infrastructure within the utility.

MS. PIETTE: Do you want to go first, Bob? I have a question on this, but I'll let you go --

MR. ROSE: I have the mike, so --

(Laughter.)

COMMISSIONER ROSENFELD: I can't hear you. Do you really have the mike?

MR. ROSE: Well, now I have the mike. A couple points. In terms of the confidentiality one of the things we are trying to do is to allow any third-party utility to host this benchmarking.

And so to the extent you shoot the data over to our system, we kick back a score. And we don't need to save that data. That's not interesting to us.

So, that allows you to solve, in part, that confidentiality issue. There's still an IT effort to it.

But the larger thing I wanted to get at is I could see where utilities would at least offer to the end user, here's five default values we've assigned to your facility. Nonetheless, from that here's a score. And so that user can see those defaults right in front of them. And to the extent they, at a local level, input the other

data, because the energy's already there, they get a more refined score.

And to the extent that could occur right on a utility website, then again there's no confidentiality there. Anyway, that's what I wanted to say.

MS. PIETTE: Lance, I'm curious about the scenario you just explained.

COMMISSIONER ROSENFELD: Mary Ann, speak into the mike and say who you are. This poor -- my friend here is going crazy.

MS. PIETTE: Sorry. Mary Ann Piette. I'm intrigued by your idea, and I think one of the challenges that Bob and I have is there are a lot of ideas talked about today. And I agree with Art, that we have to have a tighter group of people who are going to help us define what California is going to do and build.

And I'm curious about your sense about your organization's interest in defining and building that underlying system. You talked about, for example, ten class A offices in your area. Is that something you see the utility actually helping to identify and build? Or are you thinking some of the things that you heard

between my talk and Bob's talk that there's enough information there? Or what are you thinking about how you'd organize and obtain that information?

MR. DeLAURA: I'm not sure I have an opinion yet on the other information. I would say that, you know, just to go to Art's comment, that I don't think the utilities are expecting others to have to do all the work and then we sit back and say, well, you know, we'll show up and be the marketer for this stuff.

I think we do need to be involved in the beginnings of this. I think we should help to shape some of the sensibilities of doing this. There's a number of ways to do it. You know, the least cost may not be the right approach; and certainly the most expensive is probably not do-able. So you want to find some middle ground there where it makes sense.

And also, in my mind, I think the thing that's the most important is what's the most meaningful to the customer when they get this stuff. When they see it, is it enough, you know. We don't need to have the perfect situation here. Is it enough to get them interested. Is it enough for them to engage in discussion maybe with an

account executive that may be calling on them from the utility, or to make an inquiry of the utility. That is what we normally do. And that's working with customers on energy efficiency solutions.

The thing is to get them motivated; to get their interest; let them know there is a problem. You know, they're all concerned about their bills, but the may not know what they can do .about their bills and how the economics work by investing a little bit of money and getting some payback hopefully, so it makes sense.

And I think the art of this is finding a way to give them enough to do that. And then they call us. And then we step in and do what we normally do.

MR. PETTIS: If I could follow on that comment. One of the things that just occurred to me as I was listening to everybody, you know, we have the 80/20 rule where we have 80 percent of the population uses 20 percent of the power. But in my mind that's where we should be marketing this whole effort.

Because this summer, as homeowners, we're all going to be looking at our bill and saying why is it going up; because a fuel

adjustment cost charge just hit our bill.

And I think part of the driver is a financial one. The homeowners are the CEOs, the COOs, the presidents of these companies that we're trying to target and get this other, the 80 percent of the energy use, change from.

So I really think we need to address this on a statewide level from, you know, the individual resident of California, you know, the state, that wants to be a good steward to the environment. The only way you can do that is to have a benchmarking system that everybody understands. Like, you know, we have our fuel efficient standards. I mean that's going to become more and more important as the cost of gas continues to go up.

And everybody's going to start paying attention; and we'll probably start buying all Prius, you know, pretty soon, if we're not doing that already.

So in the area of benchmarking on energy use in facilities, I think the same rules hold. And it's pretty much proven itself.

So, if this program is going to be effective, it's my kids, my teenagers need to be

able to understand this in order for it to be effective. I really believe that.

And so that they get the message; and our trustees and our corporate boards, they're the ones that are going to demand that this happens. And we need, as, you know, the folks that actually are down here in the trenches where the rubber meets the road, developing all this stuff.

Yes, we need to get to that level. That ultimate level where we're at the system level and we're looking at how to really refine this. And that's all well and good. But I think you have to start really at a base level and come up with a benchmarking system that's user friendly, easy to use, it's out there, everybody understands it. It has to have some good marketing behind it. And it will drive itself.

And I think that's really important. I think that's where we need the support of everybody, in our different positions, in this room.

COMMISSIONER ROSENFELD: We may have a problem here. I'm not quite sure when you bring in the word residential. I mean as I understand our mandate here because it comes from the green

buildings initiative, which is nonres, we're supposed to be concocting a tool which, you know, five years from now might be able to handle your home. But we have a pretty definite mandate about priorities.

I would say, as I understand the executive order and the steering committee behind it, there's a sort of immediate priority of publicly owned buildings. Because they're the government or the California State University system or whatever, has a little more authority over its building managers. It can basically say pay attention to this.

So I see sort of mixed priorities. One is publicly owned buildings of all sizes, including the smaller ones. On the other hand, as Lance DeLaura just said, there's a big temptation to start with privately owned nonres buildings, with the larger ones, just because they're less people to deal with and easier to get their attention and easier for you to handle a smaller number of them. So, I guess those activities sort of have to go on in parallel.

And then I visualize it more nearly at the end of the cycle we'll be getting down to

customers of, you know, 50 kilowatts or whatever. And then eventually by that time everybody in California is going to be submetered with interval meters anyway, and houses and homes will be, of course, a very interesting and easier to handle thing. Unless you think that handling 12 million homes is a problem.

MR. GARCIA: Evan, you had a comment?

DR. MILLS: Yeah, I just wanted to reinforce what Len was saying, and try to drive us a little bit towards maybe some kind of an action item, or more specific articulation of what should happen.

So we need to understand the customers better. We need to understand what they'll respond to and find properly, not too complex, not too detailed. And then we also need to understand what they want in the denominator. Is it per student; is it per megabyte of information served through datacenter; is it per square foot?

I'm not a fan of focus groups at all, but I think, I mean the utilities are the ones who deal with the market research, and I presume some or all of you have already done work in this area. And some of that may or may not be proprietary.

But I guess the question for kind of Al and the Commission is what, you know, a) there should be some kind of activity to pull together what's known about customer information research. And probably to do some new activity that is going to be in the public domain, would be available to all the utilities. And to inform, you know, the design of the tool and the choice of metrics.

And it's hard because you want to have a tool to show to these people, but you don't want to develop the tool without the input. And so there probably is some iterative, probably has to be done multiple times.

I don't know, you've probably thought about this already. It's seems like something that has to start at least early and stay with the project through to the end.

MR. GARCIA: Let me make a couple of comments and share with you at least my thinking on this stuff.

I call the computation of the measure, I call that the algorithm. And --

COMMISSIONER ROSENFELD: You call that the what?

MR. GARCIA: The algorithm.

COMMISSIONER ROSENFELD: Okay.

MR. GARCIA: And the wrapper that you put that algorithm in is basically the marketing communications. And, you know, in one case it could be a webpage. It could be some other device to transmit this information to the customer.

I actually wanted to hear some conversation from the group here as to what alternative methods to a webpage you guys might think of in terms of being able to communicate this information to the customer.

I pretty much agree that we need to all consense upon one common algorithm, so that, you know, the measures that Gary does down at DWP are comparable to the measures that Sempra Utilities have. Because that's part of the stuff that our corporate customers want That's what CSUS wants; that's what UCOP wants; that's what the State of California wants.

Anyway, you had a comment?

MR. ROSE: Well, in our experience the website is actually the way to go. To the extent that can then be pushed out into other formats, hard copy and so on. So having, if you can get on a website you can do anything, but I would stick

with that as a goal.

Nonetheless, and back to the algorithms, the algorithms with benchmarks are extremely simple. They're published on our website. Mary Ann could just as easily publish or let those things be known how her system works in the public domain. And those can be put right into, again, any third-party server.

So earlier I said data could be shared between say for example the EPA and the utility. Well, we could skip that all together, at least for the next year, and you take the algorithms, which are not very complicated, and do the calculations on your own server.

The only other things that we do that's fairly unique is we're allowing people to group their buildings up together. And we're allowing them to date-stamp some of the data if that data changes every time. And that can actually be pretty sophisticated in terms of programming.

But the basic benchmark is five coefficients and a look-up table that we then place you on. It's 100 numbers. So there's no reason you couldn't just take those algorithms and program it, yourself, on your own server. That

would be the most prudent way to get this going. And, again, you have the default values that you'd share with your customers.

MR. GARCIA: Evan.

DR. MILLS: I still think there's this issue of presentation. And, you know, look at Mary Ann's talk, my talk, Bob's, there's so many ways to visualize this stuff. And it's easy to make webpages. But there's an art to making information digestible. And if you're trying to reach the mainstream, it's all the more sensitive.

And there are people who've made, you know, an industry of this. I think of Willett Kempton, I don't know if he's still in this field, but, you know, an anthropologist and social scientist by training. He's done a lot with, you know, communication through bills and webpages. And I think just bringing some of that talent in.

And you've probably had more experience, you know, than anyone. But let's just -- it's not just the algorithm or just the choice of the web, but the real specifics of the delivery.

MR. ROSE: When I say webpage I don't mean visually. We believe --

DR. MILLS: Um-hum, the channel.

MR. ROSE: We believe people want the portability of a unit-less number. And we've seen them be attracted to that.

I don't mean website in terms of a graphical presentation. I just mean a place, a depository for them to get that number. In our experience it is that one portable number that's ultimately of interest.

Because then you can average the number. You can add the number. You can, you know, do other things with it.

COMMISSIONER ROSENFELD: I think -- the point has been made several times today, I don't even know who to refer to, that hospital administrators want to know dollars per bed, and I guess prison administrators want to know dollars per prisoner. And who cares about square feet.

And on the other hand, office owners probably want to know either per person or per square foot.

And I'm sure that the individual webpages would be quite different depending on what class of customer you think you are. That doesn't bother me much.

Go ahead.

MR. ROSE: Although I would say on a dollar per hospital bed, you would still want to relate that to the average or the distribution of dollars per hospital beds.

But I would argue that you can say this is a dollar per hospital bed ranking in which you're in the top or bottom quartile. I do think you still want to resolve it down to a unit list number that lacks engineering units.

COMMISSIONER ROSENFELD: Oh, sure, I think --

MR. ROSE: Okay, just --

COMMISSIONER ROSENFELD: Bob, I think in the long run everybody has also said basically we want to know are we in the upper quartile, and quartiles are unit-less numbers, and we all agree with you, yeah.

MR. ROSE: Yeah.

COMMISSIONER ROSENFELD: I actually am going to ask Mary Ann a question before she asks her question. And that is I don't really have a clue, I'm back to money and budgets and getting lines written into budgets. I don't really have a clue as to what it's going to cost per unit. And you can think hospital bed, or you can think

square foot or whatever.

But, you, Mary Ann, at least have dealt with you know something -- well, the CEUS people here know a lot about what it costs per building to actually go in and get the information. That seems to me the most critical thing we've got to budget. That is, in this modern world getting kilowatt hours or getting therms, well, you've got to get all the meters, I guess, and make sure that the meters are connected with the premises.

But that seems relatively trivial compared to how much information it takes at a building to get meaningful denominators. And is there floating around, or can you and your colleagues, your CEUS colleagues, come up with a basic fact sheet which says in order to deal with a typical office building or school or prison or whatever, it's going to cost you so many dollars per something or other, per square foot, per person, whatever, and somehow or other communicate that with Lance DeLaura and his friends?

MS. PIETTE: Art, are you asking if you want to -- if a hospital wants to benchmark their building --

COMMISSIONER ROSENFELD: Yeah, yeah.

MS. PIETTE: -- how much does it cost for them to get the information to do the benchmarking exercise?

COMMISSIONER ROSENFELD: Yeah, assuming that this CEUS data has all been processed and they just want to know where they are in quartiles or whatevers.

MS. PIETTE: Right. Well, I think that the challenge that we face is when we ask that question what does it take to get a benchmark. Is it a simple, or is it a complex benchmarking.

We talked about layers, I talked about layers. A simple method is trivial. They could do that in a couple hours, right, to get a first-level pass.

If they're going to go deeper into end uses, it could be --

UNIDENTIFIED SPEAKER: (inaudible).

MS. PIETTE: Yeah. I mean, but I think an initial pass isn't a huge amount of effort. So we don't think -- we don't know, though, because -- but that's our sense. So I don't think it's a huge amount of work.

I think -- now, it's important -- the benchmarking, end-use benchmarking that we were

talking about is not an investment-grade audit. It's an initial estimate of some of the end-use characteristics, right. So I think you could probably get that in a day or less.

COMMISSIONER ROSENFELD: So, just to pursue this 30 seconds more, I'm the -- one minute more. I'm the facilities manager for an office building. And either I'm curious, myself, or my boss sent me a query as to where do I stand, and I want to know my percentile within plus or minus 10 percentile points or something.

I'm assuming that a system will exist in which the kilowatt hours and the therms get turned into even time dependent valuation of dollars. But I need denominators of square feet, or people and something about usage pattern and so on.

MS. PIETTE: Right.

COMMISSIONER ROSENFELD: Are you saying that's a --

MS. PIETTE: That's readily --

COMMISSIONER ROSENFELD: -- couple of hours work?

MS. PIETTE: -- available. Yeah.

COMMISSIONER ROSENFELD: That's good to know.

MS. PIETTE: That's good to know. I want to --

COMMISSIONER ROSENFELD: Now you can have the mike, Mary Ann.

MS. PIETTE: Okay. And I can ask Bob this question; he can answer about Art's question, as well.

You just make a comment about you feel very strongly it needs to be a unit-less number.

MR. ROSE: Or quartiles, --

MS. PIETTE: Or quartiles.

MR. ROSE: -- but, yes. Or --

MS. PIETTE: And I think --

MR. ROSE: -- something --

MS. PIETTE: -- I think, I think, I don't know, I think we have to consider other metrics. We know that people understand miles per gallon. You know, there's a lot of metrics that people do understand. And part of our challenge is educating building energy people.

While we all say we want simplicity, we also want robustness. So I think that's our greatest tension, is how to hit the high level marketing messages and also move towards robustness. And that's my --

MR. GARCIA: I actually want to make a comment here, because I've talked about this topic with several of you -- one of you or more, over the last few weeks.

And I think one of the things that we kind of sort of agreed is that we probably, at the very least, need to have some kind of a common unit or unit-less expression.

But, the people that I've talked to also recognize that it's also very important for the customer to be able to personalize that. That's part of the message that I got from Martha's presentation, is that, you know, -- and in talking with Harry in corrections, many times you need to be able to make the number meaningful to you and your business. You need to be able to express it in a manner that makes sense.

So I think the question is not an or question, but it's an and question.

MR. DeLAURA: I think the only other dimension to add to that, though, is going back to the utilities. Especially for the larger customers, as I mentioned earlier, they have account executives that are assigned to them. So I don't think we necessarily need to burden the

tool or burden the initial information with giving the total answer. Because the total answer could be sliced and diced a bunch of ways. It may not be one answer, it could be several solutions.

And, again, in my personal belief, my humble opinion is that we need to give the customer enough information to motivate them to go to the next step. And motivating to the next step for most of these people isn't going to be to pick up the phone and call a contractor after they've been on a computer website to say, where do I sign.

They're going to want a lot more information. They want a human being to come out and walk the property with them, and see what's actually going on. That's where you're going to get the level of detail. And that's where the tradeoffs are going to come in terms of the economics for that particular property owner.

And I think if we put too much burden on the software or anyone, it's not just the utility, it doesn't matter where it's residing, I think we're expecting too much of the software. And also I don't think we're going to get the results from the customers that we want to see.

COMMISSIONER ROSENFELD: Well, I'd like to ask, I'm sorry I'm horning in, I'd like to ask Mary Ann to clarify a little bit.

Let's get back to your car example for a minute. If I'm going to take some advice seriously enough to even get on the phone, as you said, or call my facilities management, it seems like at a minimum there are two things I want to know.

One is how many miles per gallon, and your unit for that would be dollars per square foot per year.

And the other is where do I fit plus or minus 10 percent all points, roughly. That is, it's nice to know that I'm low or high in dollars per year, because that's what's going to cause me to do a commissioning contract.

But I also sort of have to know whether I'm in the -- I'm very curious as to whether I'm -- which quartile I'm in, or plus or minus ten points.

So that's not really controversial. I mean any minimum tool is going to have to give you that sort of information, right? And then Lance wouldn't mind deeper, if you get the customer --

if you catch a fish.

MR. DeLAURA: Right.

COMMISSIONER ROSENFELD: Yeah. Bob.

MR. ROSE: I'd just like to agree with that. Part of the presentation I made earlier is the extent to which high and low scores really aren't causing people to jump to action anyway, to form a context.

But Lance is right, even moreso than I think I had realized earlier,-- or I shouldn't say you're right, but I think you're on to something, certainly, which is if you have this tremendous goal in front of you and you can offer benchmarking, and your call frequency goes up 10 percent, you'll probably deem this to be successful.

And then once they call you can engage with other information collections. I hadn't really thought about that earlier. And that's mainly to your point, Art. So perhaps this is less complicated than I had thought previous.

MR. BLUM: You have also to think about that the contractor who is doing the building -- you understand me --

COMMISSIONER ROSENFELD: Hold on, excuse

me, tell us who you are for --

MR. BLUM: I'm Helmut Blum, European Rolling Shutters. I do exterior shading device. But I do not want to talk about that.

Only think, you know, as I do, commercial as well residential. So you have to think about the guy who does maybe whatever the situation might come out of the benchmark, testing, that the same man is doing both locations. And then you also have to think about that 67 percent of the homeowner of the houses built are building from a homeowners association. And that is for the builder commercial project. He is not looking at individual homes.

So, you have also to think about, you know, he will probably know. So I see it as very tough to make such a cut. I see your mission. But can you really do it, you know, that's the question.

MR. GARCIA: Thank you, Helmut. One topic that I'll get in trouble if I don't address is, you know, we've been talking in terms so far of the utilities being the delivery agent for this information.

What about other partners, you know?

For instance, ESCOs. You know, ESCOs are very interested in getting involved with this and participating in this. And they see that, just like the utilities do, that this is an opportunity for them to market their products and services.

What are the thoughts about that? Don't all jump at the same time.

MR. DeLAURA: I'll give you a very generalized answer. And this is based on very recent experience that's happening today. As we speak there's what's called a PAG meeting that's going on. This one is a statewide PAG meeting. It's a program advisory group that the utilities, the IOUs, have been meeting with now here for almost two months, in helping develop this next cycle of programs.

And I would say without any exception there are ESCOs that are members of those advisory panels. So any of the program planning, any of the handoffs that might be done are being done in concert with the ESCOs.

You know, it's not a blanket statement to say that every lead is going to be handed to an ESCO, but maybe it can be done in a certain way where it's neutral. And it's really market take

your own place, you know. If the customer is comfortable in speaking with the ESCO to get their advice, because that's who they deal with now, then so be it. And if it's that they have a relationship with the utility account executive, so be that, as well.

I'm not sure there's really a bias there. That's my personal opinion --

MR. GARCIA: Let me ask you a question in this manner. Because it's been asked of me. Certainly the utilities can utilize benchmarking information as a tool to target customers, prioritize customers in their participating in the various programs.

It is pretty clear to me that because of the confidentiality issues you cannot make that information available to the ESCO. And --

COMMISSIONER ROSENFELD: Whoa, I'm going to interrupt you.

MR. GARCIA: Okay.

COMMISSIONER ROSENFELD: As a regulator. In putting together the vision for information so this is Energy Action Plan visions and so on, we have stated more than once that customer information on utility bills, kilowatt hours per

hour each hour and therms, are the inalienable property of the customer.

Now, the utilities may well bank that for them. But as far as I'm concerned, I'm just going to make a very strong statement, and then Lance can tell me if the utilities see it that way, as far as I'm concerned there aren't any proprietary issues in the following sense.

If I want to know what my percentile is then that's going to be based on a certain amount of public input data which doesn't have names on it, and specifically I have in mind 2800 CEUS buildings. Or a bunch of building from CBECS if I'm looking at Bob Rose. But that's public information.

And if I, as a utility -- I'm sorry, if I, as a customer, am curious as to what my percentile is compared with either of those databases, suitably corrected for degree days or whatever, I can call my friendly utility and they have an obligation to use their data to help me find that out. Or I can go to ITRON, if they offer that service, and ITRON has the privilege of calling the utility and getting the last ten years of data, or whatever. And, by God, the utilities

will give it to them. That's the way the vision is being put together.

MR. GARCIA: Yeah, I wasn't referring to that, Art. I was referring to -- and the utilities can jump in and comment on this in a second -- but, I was referring specifically to ESCOs or any other vendor gaining access to the information and using that as a prospective tool without the customer's permission.

And I --

COMMISSIONER ROSENFELD: Oh, without going -- okay, all right.

MR. GARCIA: -- I think most of these guys would --

COMMISSIONER ROSENFELD: Go ahead.

MR. DeLAURA: Then you're right, but you're both right in what you said.

MR. GARCIA: Okay.

MR. DeLAURA: As long as the customer gives permission for access to data there's not a problem. It can be shared with anyone. The customer has to give us a written authorization.

But as far as a marketing tool for an ESCO, there's a couple of things. One, an ESCO is certainly not prohibited from having a discussion

with a customer that has already gone on the web or whatever resource it is and has garnered their data.

Two, if an ESCO wants to use information as far as mining, I think one thing they might be able to do if we set up this database correctly, is to look at certain regions and look at the propensity of buildings that fall below that percentage, just in the aggregate.

And that becomes a mining opportunity where these ESCOs could send out mailing, or they could knock on doors and say, did you know the majority of buildings don't meet a certain standard, would you like to have yours addressed. And we can do that for you.

COMMISSIONER ROSENFELD: But it is correct, I hadn't thought about this, if I thought it was important to have an absolutely equal playing ground between the utilities and ESCOs, I don't think that's necessary, the utilities do have a slight edge. They can mine ahead of time because --

MR. GARCIA: Right.

COMMISSIONER ROSENFELD: -- they have the data. The ESCO doesn't have to work very

hard, but it does have to have to have you say, it does have to get a fax from you or something saying I'm your agent, give me the data.

MR. GARCIA: Exactly.

COMMISSIONER ROSENFELD: Yeah, so there's a slight issue here. But I don't think it's very serious.

But, thank you, you're right.

MR. GARCIA: Thanks. Bill.

MR. PENNINGTON: It seems like right now --

COMMISSIONER ROSENFELD: Bill, use the mike.

MR. PENNINGTON: I don't need a mike, -- just shout.

COMMISSIONER ROSENFELD: Just shout.

MR. PENNINGTON: It seems like the confidentiality issue that's not so much this one, although maybe I don't understand it very well; maybe there is some sort of issue I don't understand very well, but there's a issue with the confidentiality of the CEUS data.

COMMISSIONER ROSENFELD: The confidentiality of?

MR. PENNINGTON: Of the CEUS data.

COMMISSIONER ROSENFELD: Yes, somebody explain that to me because it's all just statistical data, all the individualities have, to my mind, disappeared. Go ahead, Bill.

MR. PENNINGTON: Well, I'm not sure I can justify it for you. But there is a issue with it. And I think that may be a area where we need a lot of help from the utilities to figure this out.

Because my understanding is that the CEUS data confidentiality is related to the IEPR confidentiality data and forecasting. It's all bundled up, and it's all a mess.

And, you know, the data's supposed to be done and created by June. And I don't think anyone has any sense for when we might actually be able to get it to LBNL to start work on this tool because of the confidentiality.

And so, you know, I would say SDG&E and PG&E and Edison, we could really use help on trying to -- it's sort of another part of the company, I think, maybe, where the issue is happening.

MR. DeLAURA: And I guess my suggestion would be, rather than attempting to answer that

here today, maybe what we do what was mentioned earlier. We get a few representatives in a smaller group and we commit to immediately within the next couple of days having a meeting about this. And start to explore that idea.

Because I'm sure there's some solution. I don't know we're equipped to answer it today.

MS. BROOK: I just wanted to add to Bill, we're sure, from the Energy Commission Staff perspective, that it's an issue that needs to be addressed. We basically think that we need to prove to ourselves and to the utilities that the data will not reveal, once we aggregate it for benchmarking it won't reveal individual identities.

COMMISSIONER ROSENFELD: Sure.

MS. BROOK: But that hasn't been proven to anybody's satisfaction yet. And it's an issue that needs to be resolved quickly.

COMMISSIONER ROSENFELD: Let me just make one obvious remark. The example that's usually given is if you want statistics on a building that's more than 5 million square feet located in a certain zip code, then, you know, the only one in the country is the Pentagon. And

somehow or other its anonymity has vanished.

But even that shouldn't be a terrible problem. Using our famous 80/20 rule again, let's get the goddamn data so that 90 percent of it is useful and if one huge hospital somewhere has to be left out, let's figure out -- let's fight only about that one for the next month.

MS. BROOK: I would just say that --

COMMISSIONER ROSENFELD: Martha, I've provoked Martha.

MS. BROOK: -- if the rest of the Commission was as amenable as you we wouldn't have an issue, Art. But, we still have to deal with it.

COMMISSIONER ROSENFELD: I think -- I bless you and Bill for raising it, though. Let's really try to focus on getting that silly problem solved.

MS. PIETTE: We initially were thinking, well, and I should say what we think the technical issues are, that if we were given the zip code that some buildings, you're right, they could be identified because there's a huge hospital in some zip code. But, then we're thinking, can we drop off a, you know, only four digits of the zip code.

Then we were thinking climate zone, just the 16 climate zones.

But then with the weather normalization there's issues if you put in -- but you've already weather normalized it. So climate zone's a possibility.

So that building could only be identified in one of the 16 climate zones. And so we're losing geographic information, but it may be I think we can come up with something simple.

MR. GARCIA: I don't want to cut the discussion off, but I think Lance was absolutely right. And that's this is committee work that needs to be done outside of this workshop.

And we actually have an internal meeting scheduled for next week, because we don't even have a consensus internally at the Commission as to what the problem is. So we will be talking with the utilities about this.

And I, like Art, I believe that there is an answer out there. Okay.

MR. SHEEHY: Craig Sheehy, Thomas Properties Group, representing BOMA International and BOMA California.

I would just ask that we also make sure

that BOMA California is partnered in this. We represent 660 million square feet here in California. And you have quite the opportunity to reach a wide range of people.

And also take a look at BOMA International with partnership with EnergyStar has put together a new operational efficiency program called BEEP, which is BOMA Energy Efficiency Program. And there are six classes that have already been put.

And it's to come up with low cost, no cost ways of educating the property manager, the operator on these energy efficiency ideas. And we know the cheapest form of energy is one not used. And it's coming up with efficiencies to teach these people.

And one of the courses is benchmarking. So, there's a program in place that you might want to take a look at that will actually get out there and educate the commercial real estate sector.

COMMISSIONER ROSENFELD: Let me just congratulate you for a second, and say that this is a little off, but up till now sort of mindlessly we've been saying this is a collaboration of the CEC and the PUC and the

utilities, including the munis.

I'm absolutely a believer that we should have -- that the green buildings initiative should have a small contract with BOMA for an office in the south part of the state. I understand there are people down there, too. And an office in the north part of the state.

The green buildings initiative calls for a real estate industry's leadership council. I am the author of a memo which says that council's not going to go anywhere unless it has some staff. And BOMA should be the staff.

And, you know, welcome into the benchmarking club, because it's in your future. It's going to come down the road. So, you know, for goodness sake, collaborate with the rest of these people.

MR. GARCIA: And before I get to you, I also want to recognize BOMA as being one of the stronger partners that the Energy Commission had during the '00 and the '01 energy crisis. They delivered the capacity that we needed at the time, and we appreciate it.

MR. DeLAURA: I think we have a tremendous opportunity with BOMA being a part of

the team to solve some of this issue about focus groups and about what's meaningful to customers. We have the customer sitting right here. And representatives that BOMA can leverage through that can tell us what is meaningful to them, so that we're not over-delivering and that we are doing what we said before, giving enough to stimulate interest and enough to take it to the next level without over-delivering. I think it's wonderful.

MR. GARCIA: Are we running out of steam here?

MS. BROOK: What time is it?

MR. GARCIA: It's 3:00. And actually I want to poke at this thing one more time. And that's the issue of cost recovery. And I'd like to get some more feedback from, you know, the utilities on this.

Because, you know, as I mentioned before, there's at least three ways that I've identified the cost recovery can take place. Either through PGC, through procurement or ratebasing it.

And this is just my opinion, and I'd like to get some feedback from you all that the

actual practitioners, the people that have to live with that. Any thoughts?

MR. DeLAURA: I guess I'll add one thing just to start the ball, and then maybe others will speak.

I think it's a very difficult question to answer here today because we don't know what the magnitude is. Is it something that is tens of millions of dollars initially? If it is, energy efficiency is probably not the home for it. We don't have that kind of room in the budgets.

Is it less than that? Is it dramatically less? Maybe there is a fit. Maybe it's a blend of those things. But not knowing exactly what the number is, or even having, you know, a bounding of what the number is, it's difficult.

My best recommendation would be with the subcommittee to take that up. And for that subcommittee immediately to go back to their leadership and to test that and see how things are fitting.

But I can tell you at least in my utilities we are very thinly stretched on energy efficiency dollars. As a matter of fact, we are

so thinly stretched we are concerned about the goals. We are going to make the goals. We're committed to making them, but the way to make them through delivering hard widgets that bring hard energy savings back is the primary focus of the dollar.

So to introduce something that then would be another information program becomes problematic for making the goals without either raising those budgets or finding another funding mechanism.

So I don't know the answer, at least, again, from my utilities today.

MR. GARCIA: I'm not really looking for an answer today on that, because this is going to require a lot of discussion back in your home offices. But I would like, when you guys go back, I would like you guys to talk to your management about this.

Somebody estimated that in aggregate the amount of capital that would be required to implement this would be about $100 million. Well, you know, there's probably not enough room to accommodate that.

And, you know, you really need to be

thinking about that. So that when we actually sit down with the PUC and engage them on the subject, you know, we can talk, you know, on greater depth and more intelligently.

MR. ROSE: Was that 100 million for benchmarking? No. Hundred million for what?

MR. GARCIA: The 100 million was a number plucked out of the air. But I guess I'm not that uncomfortable with it when you consider that if you're going to do something like this, you're going to have to start messing around with the customer information systems that the utilities have; many of which are legacy systems.

And if you're going to be doing that, it might trigger some other capital expense.

COMMISSIONER ROSENFELD: I will make a remark, whether it's 100 million or 2 million. But this is sort of looking at you and Lance and the funding subcommittee.

There is a memo floating around right now from a number of us who first -- this is a little bit of history, but I'll get to the point -- there is this problem the way the public goods money is handled. That there are what I will call delivery programs.

So you show the PUC your plans to deliver a million EnergyStar refrigerators or 10 million compact fluorescent lamps, and they save a lot of megawatts and you get credited on your goals for that.

And those programs have to carry along a lot of programs which are called for information only programs. They're not for information only programs, but that word means you don't get credit in your goals.

And that's stupid. Because it means that the utilities are discouraged from doing things which will pay back in the next cycle. And Peter is nodding his head there.

That first came up when I wanted to get more money for emerging technologies. Well, you know, if you're putting money into a brand new technology during the years '06, '7, and '8 you're not going to see the returns till '9, '10 and '11, or whatever. But you know you're going to see them statistically.

And the same thing applies, and Bill Pennington is here, the same thing applies to the money which the utilities put into helping us improve the standards. If you put money into what

are called case studies for adding things to the standards, well, hell, the next set of standards aren't going to come in till 2011. But you're going to spend the money now.

And so luckily Meg Gottstein, the ALJ in charge of administration, agrees with me that this is real problem. And she's all for utilities saying we want to spend money on XYZ. Al, I don't go along with your 100 million, but it could be 10.

But anyway, here's an identified amount of money and it's not going to pay off now because we're still making a tool. But we think it will help greatly with commissioning. And we've proposed 50 percent credit for this or something, instead of calling it just for information only.

And I think the feeling at the PUC, I'm encouraging you guys to do that, is that these are worthy applications. That there are a whole bunch of areas where we should be doing it, and we will do it for the '06, '07 and '08 cycle.

MR. DeLAURA: I don't disagree with you at all. In fact, I think that makes a lot of sense. And, Art, as you know, there's work underway right now on the case studies with the

codes and standards to find a mechanism to actually get credit for the --

COMMISSIONER ROSENFELD: To value them, yeah.

MR. DeLAURA: Yes. I guess I would make a request, and then we can talk offline in terms of how best, but the whitepaper is a good example. With the relationship that the CEC has with the CPUC and your influence, in particular, was very helpful with that whitepaper.

So if we can count on you, I think the answer is yes. I think I know the answer, but I just want to ask for your support when we do have that discussion, to know that that's there, I think that would be helpful with the PUC.

COMMISSIONER ROSENFELD: Absolutely. Thank you, Lance.

MR. PARKS: Jim Parks with SMUD. And, you know, maybe I'm a little naive, but I want to be clear on what the utility role in this is. I've always felt like the utility role in this was to act on an advisory committee like we're doing now, and we'll continue to do in the future. But that the full cost of the development of this benchmarking methodology wasn't going to fall on

the utilities directly. But that this methodology would be developed either through PIER funds or other resources, and then would be available on a statewide basis to all of our customers.

And so I wasn't really looking at it from a perspective of spending $100 million of utility money to help our customers work through this methodology.

Once the methodology is developed and available then I would view the utility role as advertising that this is available to our customers through bill inserts, websites, mailings and those sorts of things. And then assisting our customers in going through the benchmarking process in the hopes that they'll do some energy efficiency as a result of that process.

And so maybe I've been misreading it, but I'm trying to figure out where the big expenses are coming from. SMUD is committed to this and we're willing to devote resources to it, but when you start talking, you know, in the hundreds of millions of dollars it starts scaring me a little bit.

COMMISSIONER ROSENFELD: It scares me, too.

MR. ROSE: Yeah, the hundred million, don't spend a hundred million on benchmarking. I can tell you all the reasons it's, you know, again it's not going to, per se, one-for-one deliver energy efficiency. We know that, but not a hundred million. I just have to say that.

We met, prior to me coming here, in my own office, and we kept tripping over CEC and the utilities and the programs, and I was quite frustrated in that conversation. And I finally said, forget all that. What should somebody do if they're trying to get some motivated to improve efficiency. Forget the programs and the public good money.

And then we finally started to brainstorm. And some of the ideas we came up with is if you participate in the utility program they would ask that you first benchmark the building.

Mary Ann's right. It doesn't cost but anything really for them to enter a few parameters. And just merely ask that they share with that utility what that's for. It doesn't even have to be electronically. Just send them a fax, figuratively speaking.

And to the extent that leads to them

working with that customer because they've already called looking for a variable speed drive, they can then make the suggestion well, why don't you benchmark your other buildings and see how those compare. So it can be a lead into other projects.

Those are just some of the ideas that outside of, you know, the formality of all of this, that you use benchmarking to just engage with somebody and then encourage them to go further. And maybe it's a simple benchmark and they add more parameters.

But I'd like to hear more of that type of conversation, as well, in the mix. I don't think it has to be a real fancy effort. I'm not here to push EnergyStar at the moment, I mean, broadly I am. But we have a website you can go in and ask people to type in five numbers and can get a score. So don't overlook that. Or LBNL, for that matter.

MR. GARCIA: Bill.

MR. PENNINGTON: Maybe it would be more appropriate for you to respond to these questions, Al.

I mean I think the problem is that there's been this goal of a very large number of

buildings that need to be benchmarked just about as fast as you possibly could imagine it happening. And so how do you do that in a central way.

Seems unlikely that without the utilities being aggressively pursuing this goal that it would happen. So I don't know if that's a complete answer from your vantage point, but --

MR. GARCIA: Well, I guess the only other thing that I would add to that, Bill, is that it's the difference between --

COMMISSIONER ROSENFELD: Your mike, your mike's not on or something's wrong with your mike.

MR. GARCIA: How's that? The big difference is, you know, a push approach versus a pull approach. And, you know, what Bob was talking about, that at least sounded to me like, you know, there's a customer; he's pulling the information.

But the point that you were trying to make, Bill, is that we've got a huge goal out there, and the only way we're going to make this goal is if, you know, the utilities push that information out there and aggressively push and market those programs through benchmarking.

MR. ROSE: Well, I'm not trying to undercut the goals, but there's something you can do now which is to simply engage with end users if they want to participate in a utility program, would have to (inaudible) benchmark very simple.

I agree in the longer term, years two, three and out to 2015, but I just didn't hear a sense of that. So I wanted to introduce that.

MR. GARCIA: The thing, Bob, is that I think it would be maybe nice if we could just engage in a debate on that. But unfortunately, or maybe fortunately, that policy debate's taken place, and the Governor has issued his policy directive, which is to do it according to this timeline that he's laid out.

So, you know, while we might, you know, in the absence of that we might come up with a different schedule, that's the schedule we got.

MS. BROOK: I still think that there's room for interpretation. Since we're going to recommend in July a simple benchmarking system, we can also recommend how you go from state buildings to all commercial buildings; and whether or not it makes sense to do all commercial buildings.

They're looking to the Energy Commission

and our stakeholders and advisors to tell them what makes sense. If it doesn't make sense to do all commercial buildings in California, we certainly shouldn't go after an aggressive program to do it.

And I don't know that we've actually built a consensus on that point.

COMMISSIONER ROSENFELD: Can I get on Martha's bandwagon. I see a timeline for coming up with a tool. And, you know, thank God, I keep referring to 2800 CEUS buildings, but thank goodness that database, apart from a little haggling about proprietary-ship is going to be available.

And I see, if I read the Governor's order, I see the fact that there should be a system in place so that any commercial building in California should be able to submit his data -- how do you say it, Martha? His or her data -- on some website and find out the two parameters that we need that the building owner is interested in.

And that should be open to everybody in California.

But as far as who we encourage to do it, given the fact it's been said 13 times today, that

it doesn't matter at all unless it's backed up with a commissioning or an order of some sort, and the utilities are proceeding with that in deliberate speed, I think -- I'm sort of looking at Al and seeing if I can get him to nod his head -- I think that if we provide the opportunity that's a hell of a lot different from trying to talk about doing 1.5 million customers over three years or whatever.

So I'm trying to be cautious along with you.

MR. DeLAURA: Al, could I say something before you respond?

MR. GARCIA: Sure.

MR. DeLAURA: I just wanted -- I think we're actually saying the same thing, unless I'm missing something. I hear Jim's point, and I feel the pain the same way, from the utility vantage point of building a very complicated system that may not need to exist.

And what I'm hearing is that may not be an issue. That may not be the issue. The issue may be that there's a mechanism that -- sounds like there's several, we were sort of whispering here -- there's several mechanisms for customers

if they want to seek out a benchmark today they can do it.

The issue is utilities aren't aligned at this point yet in terms of unified approach to making customers aware that the opportunity exists, and then also being ready when customers respond and say, hey, I like this, I want to do something with it. And then providing the next steps, you know, were somebody to go out and give them guidance, and set the wheels in motion. Again, not ignoring ESCOs, for them to be involved in the process, as well.

That doesn't sound like tens of millions of dollars, or even $10 million. It sounds like refining maybe some mechanisms that are already in place, delivering mechanisms that we use every day for other programs. And maybe, as a consequence, making this July 1st filing that the utilities are doing, that we add a component, some language in support of this, so it becomes part of the mantra that we have for operating the programs.

And we align -- it could be as simple as aligning our websites where there's links to these varieties of tools that exist today. And then have the mechanisms to follow up. We make the

commitment to have the mechanisms to follow up. And that doesn't sound like even a million dollars.

MR. GARCIA: Well, let me say this. I regret that we quoted, or that somebody -- the $100 million. But let me say this. If the utilities were to go down the path where they're gong to integrate benchmarking with their customer information systems, and they wind up having to, as of a result of having to update old COBOL systems and what-have-you, I don't think $100 million is out of the ballpark.

(Parties speaking simultaneously.)

DR. MILLS: -- and the infrastructure is there to mobilize --

MR. DeLAURA: It's already there, and I think that's the point. We don't need to reinvent the wheel. We don't need to take the antiquated infrastructure that's there and build onto it. There's already an extra infrastructure that exists, and we simply need to link to that and be more the provider of the information as a followup, as a consequence of that.

MR. GARCIA: I'm not trying to defend the $100 million --

(Laughter.)

MR. PARKS: When I look at the Governor's executive order it says that there's supposed to be a benchmarking methodology and commissioning guidelines that are developed. And I don't really see that it says that all the buildings have to be benchmarked nor commissioned by any given date. And that's where it's thrown a little confusion on me.

But having said that, I still believe you don't develop a benchmarking methodology and commissioning guidelines just to sit there and not to use them. And SMUD is definitely supportive of this, and we would work to, you know, push our customers to those sites, to the benchmarkings, to the commissioning.

And I also did want to express for Mary Ann's layered approach where a customer can go in there with just a few numbers and get some useful information from their facility, but if they want to dig deeper they can do that.

And I hope some way could be developed so that you could track that by zip code or something where the customer can get the full information back, but the database would get that

customer information less the name and address and that sort of thing. But with enough information to be useful for us to use on a statewide basis for developing, you know, the baseline, I guess, for those certain industries.

COMMISSIONER ROSENFELD: I'm going to ask one question and see whether, in fact, there is a consensus. This is not meant to be nothing -- this isn't meant to be anything new right now.

As I see it, there are two very different aspects to whatever tool we're going to use. I'm being slightly repetitious now, but I want to make, see if my view of this agrees with everybody else.

The tool has access, has massaged input data, good input data. And my example, again, is always 2800 CEUS data. And that's going to, independent of how many people run queries, that's going to tell you when a single customer comes in later, I don't think it matters whether it's the first customer or the millionth customer, it's the CEUS database, properly managed, which is going to tell you where you fit. You come in percentile 42.

And then there's the query customer who

gives you a certain amount of information generated by two hours of work and he gets an answer. And these are independent operations. We don't try to take any of the million queries, which are probably based on pretty poor denominators, and refine the CEUS data. When we want better data we'll get another CEUS run or whatever.

Is that what everybody's picture is? Because that makes the costs really easier to understand. That is, there's a development cost for massaging the CEUS data or the EPA data, and getting a tool and so on. And then after that it's just a per-customer query problem.

Then there was one remark to Al. Al really knows this, but speaking -- I think I'm just trying to get credit for all the hours I've put in worrying about demand responsive meters and tariffs and so on, but in terms of can the infrastructure handle it, Al.

MR. GARCIA: I'm sorry?

COMMISSIONER ROSENFELD: In terms of can the utility infrastructure handle more queries and so on. The utilities are committed now to making a huge investment in back office software. And

that's because everybody in the state has agreed that for customers over 200 kilowatts who have the interval meters now, they are going to go on to critical peak pricing tariffs for the -- starting with the summer of '06.

That's a huge data flow which has nothing to do with us, but which is going to cause Sempra and Edison and PG&E to either make big investments or huge outsource contracts, I don't know which way it's going to be.

And so those systems are going to get modernized, luckily for us, by the summer of '06 anyway. And as long as the utilities -- and compared to that effort a few queries, even up to a million queries of where customers belong on their databases is, really, I think, a trivial expense.

So I don't see having to deal with a lot of old programs.

MR. GARCIA: Last comment for now that I'm going to --

(Laughter.)

MR. GARCIA: -- to give. You actually have to read the action plan in conjunction with the --

MR. PARKS: Yes, I figured there was something else going on --

(Laughter.)

MR. GARCIA: It's in the action plan. And the thing about the action plan is incorporated into the executive order by reference. So, everything is in the action plan we have to do.

Yes, sir.

MR. BLUM: Well, forgive me, but I made that long trip and went to the wrong meeting. But just so it might pay off, I heard from SMUD, you know, that you did a rebate program which also included retractable shading.

PG&E didn't do it. So when you talk about the 100 million, maybe there is a rebate coming out of it, too. PG&E refused me that they said okay, all my devices move. The paid for fixed windows, for something I plug into the outlet, you know, like a refrigerator. But mine, they did. But mine, and it's proven by the Lawrence Berkeley Lab from what they in their report, initially when they introduced their work, that windows had to be changed, and that 40 percent of energy is going through these doors and

window openings. And by improving the glass they catch 10 percent.

And they figured out that with my device you catch the 40 percent. And after the fact, the people who were in charge -- I can name to you -- they regret very much that they had not a chance to talk to me earlier. They said they tested, the had a refrigerator. They measured infrared, you know, I gave them the samples. And I have the infrared picture that they basically proved that they basically could catch the whole 40 percent, or they change it to 20 degrees it improved, you know.

Sorry I do not want to really, but, you see, if ever it comes to something then you should remember, you know. Okay.

COMMISSIONER ROSENFELD: As you say, this is just the wrong forum. At LBL we believe in better windows, trees to shade homes, awnings to shade windows, all of that stuff is absolutely correct. And I --

MR. BLUM: But why was I not allowed to participate in the rebate program?

COMMISSIONER ROSENFELD: But you're not talking -- but I'm not the program manager for

PG&E or Edison or Sempra. So, those are the people you have to talk to.

UNIDENTIFIED SPEAKER: Ask Peter.

COMMISSIONER ROSENFELD: The science is on your side.

MR. BLUM: I did, and I get a seven letter page --

COMMISSIONER ROSENFELD: See me offline.

MR. BLUM: Okay. All right, thank you.

COMMISSIONER ROSENFELD: Al, go ahead.

MR. GARCIA: Okay. Martha asked me to advertise the fact that we killed probably 43 trees -- that's probably another exaggeration on my part. There's a bunch of trees back there stacked on the table that have printing on them.

It's the Review of California National Benchmarking Methods, produced by LBNL. And it's back there.

COMMISSIONER ROSENFELD: Thank you.

MR. GARCIA: Anything else?

MR. PARKS: Are you going to make some action steps as far as a committee or the meeting or anything?

MR. GARCIA: Yes, but not here.

MR. PARKS: Okay.

MR. GARCIA: I want to review the transcript which will be available probably about ten days from today on the website if you want to take a look at it and review it.

Also, any written comments, send them to me. If you don't have my address, stop on the way out, I'll give you my card. And you can send it to my attention.

And if there are no other comments, we stand adjourned.

(Whereupon, at 3:32 p.m., the workshop was adjourned.)

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CERTIFICATE OF REPORTER

I, PETER PETTY, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Staff Workshop; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said workshop, nor in any way interested in outcome of said workshop.

IN WITNESS WHEREOF, I have hereunto set my hand this 28th day of April, 2005.